S/133/61/000/007/014/017
A054/A129

AUTHORS: Sklyuyev, P. V., Zamotayev, S. P., Kvater, L. I.

TITLE: The effect of steel pouring under vacuum on the quality of heavy forgings

PERIODICAL: Stal', no. 7, 1961, 642 - 645

TEXT: In acidic steels containing more than 2 cm^3/100 gr hydrogen, flocks form in spite of countermeasures taken. Flock formation can only be eliminated by decreasing the hydrogen content of the casting. This can be done by the degasification of the metal in vacuum. In the Uralmash zavod (Uralmash Plant), where ingots of up to 120 ton in weight are degasified during melting, tests were carried out to establish the effect of vacuum melting on the steel quality in detail. For this purpose 32.5 ton acidic and basic steel (34XH3M - 34KhN3M) ingots were produced by the vacuum melting process (at 5 - 10 mm Hg residual pressure) and 17-ton ingots in the conventional way. After cooling, normalization (with annealing) and soaking in air for two months, the forgings made of the test steel were controlled by an ultrasonic defectoscope on templates made from the central parts and ends of the forgings. The investigations showed that in the experimental

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The effect of steel pouring under vacuum on the...

acidic and basic steel produced by vacuum melting the hydrogen content decreases (Table 1) from 4.43 cm^3/100 gr to 1.5 cm^3/100 gr and from 7.3 cm^3/100 gr to 3.5 cm^3/100 gr, respectively, while the ingot solidified during forging and cooling after the forging process. This means that in vacuum-melted acidic steel the hydrogen content was below 2 cm^3/100 gr, i.e., below the limit when flocks develop in forgings which are cooled by isothermic soaking (calculating 6 hours for every 100 mm of the section instead of 12 hours). For basic 34KhN3M grade steels, however, 6-hours soaking is not sufficient to decrease the hydrogen-content below the critical limit and therefore in this steel flock formation cannot be prevented. This is due to the higher initial hydrogen content of this steel compared with acidic steel. When studying the macrostructure of acidic and basic vacuum-melted steel on stamps of the intermittent and central zones of transversal and longitudinal templates cut out of the center of acidic and basic steel forgings, a higher degree of casting and interdendritic liquation could be observed due to the intensive gas-separation caused by the vacuum treatment. This reduces the content of non-metallic inclusions in acidic steels about four times and in basic steels about twice. There are 5 figures, 2 tables and 4 references: 2 Soviet-bloc and 2 non-Soviet-bloc.

ASSOCIATION: UZTM

ZAMOTAYLOV, S.S.

ZAMOTAYLOV, S.S.

Partial sterility in peanuts. Agrobiologiia no.6:128-132 N-D '57.
(MIRA 10:12)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut maslichnykh i efiromaslichnykh kul'tur, Krasnodar.
(Peanuts) (Sterility in plants)

ZAKOTAYLOV, S.S., Cand Bio Sci--(diss) "Embryologic study of the peanut (Arachis hypogaea)," Mos, 1958. 14 pp (Min of Higher Education USSR. Mos Order of Lenin and Order of Labor Red Banner State U im M.V. Lomonosov), 130 copies (KL,22-58,105)

SOV/20-123-5-47/50

17(4)
AUTHOR: Zamotaylov, S. S.

TITLE: On the Peculiar Traits in the Fusion of Sex Cell Nuclei in Arachis Hypogaea L. (Ob osobennostyakh sliyaniya yader polovykh kletok u arakhisa (Arachis hypogaea L.)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 123, Nr 5, pp 941-943 (USSR)

ABSTRACT: The author describes the cyto-embryological processes in the natural self-pollination of the peanut. In Krasnodar it usually takes place at about 5 - 6 a.m. Double fertilization occurs mostly at 7 - 11 p.m. It has already been described on an earlier occasion (Refs 1,3). The author has demonstrated that, in this case, the sex cell nuclei fusion processes are greatly protracted. Syngamy takes about 17 hours, the triple fusion about 6 hours. For this reason, double fertilization is frequently observed in preparations. The structures of the embryo sac and of the mature pollen grain, as well as the process of fertilization (Figs 1 - 3) are described. Gerasimova-Navashina (Ref 2) has established 2 types of sex cell fusion: 1) the post-mitotic type, in which the male and female nuclei unite only during the first division of the zygote; and 2) the premitotic type, in which the male nucleus is fused with the female nucleus even before the division of the zygote. The type found by the author to exist

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On the Peculiar Traits in the Fusion of Sex Cell Nuclei in Arachis Hypogaea L.

in the peanut is between the types 1) and 2). Here the fusion of the sex cell nuclei begins before the onset of the zygote mitosis, as is the case in the premitotic type; as in the postmitotic type, however, it is completed only at the moment of this mitosis. When the contact between the male and the female nucleus has been established, the male nucleus swells, and a nucleolus is formed within it. Eventually the nuclear membranes are dissolved at the point of contact, and part of the male karolymph, together with the nucleolus, is transmitted to the female nucleus. The male nucleolus is usually fused with the female one. The other parts of the male nucleus, however, retain their individuality to the moment of the first mitosis of the zygote. The variations of the desoxyribonucleic acid content in male and female nuclei at individual stages of fertilization are described. At first, only one single pollen tube enters the embryo sac. A second tube enters the embryo sac (through the second synergida) either during or after the double fertilization. Its sperms are destroyed without having left the plasm of the tube.- There are 3 figures and 3 references, 2 of which are Soviet.

SOV/20-123-5-47/50

On the Peculiar Traits in the Fusion of Sex Cell Nuclei in Arachis Hypogaea L.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut maslichnykh i efiro-maslichnykh kul'tur g. Krasnodar (All-Union Scientific Research Institute of Oil and Volatile Oil Yielding Plants, City of Krasnodar)

PRESENTED: July 26, 1958, by N. V. Tsitsin, Academician

SUBMITTED: July 26, 1958

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20-118-5-56/59

AUTHOR: Zamotaylov, S. S.

TITLE: On the Sequence of Cell Division Observed in the Development of the Pre-Embryo in Arachis hypogaea L.
(O poryadke deleniya kletok pri razvitii predzarodysha arakhisa (Arachis hypogaea L.))

PERIODICAL: Doklady Akademii Nauk SSSR, 1958, Vol. 118, Nr 5, pp. 1043-1045 (USSR).

Received: [illegible]

ABSTRACT: This sequence was described already (references 1, 2), however, the opinion of the two authors as to this sequence diverges. The author of the present work has studied the embryogeny of several species of Arachis hypogaea L. He observed that the growing of the pre-embryo to the 4-celled state showed the same sequence of cell division in the case of all species which corresponds to the data from publications. In the case of all species of Arachis hypogaea the embryo developed according to the pattern of development of the solanaceae. In the course of the further development of the pre-embryo differences in the sequence of cell division can be obser-

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ved in the case of various species. Although there also exist differences within one species they are not regular but incidental. Two variants in the sequence of cell division which are distinctly different from each other were observed. One of the variants was found in the species VNIIMK 344 (of the Ispanskiy = Spanish type, figures 1 a - n). Here the apical cell of the pre-embryo is separated by a horizontal wall (figures 1 v and g) at the transition of the 4 - to the 5-celled state. In the case of 5-celled pre-embryo cells are located more or less in a line (figures 1, g, zh). From each of these cells a transversal tier is formed in the course of further development (figures 1 z - n). The cells of the 5-celled pre-embryo do not divide simultaneously, however, sometimes a 10-celled pre-embryo consisting of 5 tiers may be found (figure 1 k). Two basal cells of the 5-celled pre-embryo originate from the basal cell while the three apical cells originate from the terminal cells. The cells of both basal tiers (figures 1 m, n) later form the suspensor. The actual embryo forms from the three apical tiers. The second variant of the development of the pre-embryo was observed in the VNIIMK 433 (Valenciya type, figure 1 o - ch) species. In the case of this species the cell next to the basis divides at the transition from the 4 - to the 5 - celled state. Then both apical cells separate by transverse walls and thus, a 7 - celled

On the Sequence of Cell Division Observed in the Development of the Pre-Embryo in Arachis hypogaea L. 20-118-5-56/59

pre-embryo is formed (figures r, f). After the division of all its cells a 14-celled pre-embryo forms (figure 1 ch). From the basal cells of the 2-celled pre-embryo 3 basal cells of the 7-celled pre-embryo are formed; from which the suspensor will form later (figures 1 f and ts). In the development of the pre-embryo of this species no distinct cell tiers are observed. All cases described here refer to the development of the embryo of an overground open blossoming flower (chasmogamic). During the active growing of the ovary cell divisions of the pre-embryo gradually cease. After the penetration of the apical end of the ovary into the ground the growing of the pre-embryo is resumed. It can be seen from the above description that the contradictions of the data in publications are not due to errors of the observers but to the differences of species of the Arachis hypogaea L. There are 1 figure, and 2 references, none of which are Soviet.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut maslichnykh i efiro-maslichnykh kul'tur g. Krasnodar (All Union Scientific Research Institute for Oil and Etheric Oil Crops, City of Krasnodar)

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On the Sequence of Cell Division Observed in the Development of the Pre-Embryo in Arachis hypogaea L. 20-118-5-56/59

PRESENTED: October 21, 1957, by A. L. Kursanov, Academician.

SUBMITTED: April 4, 1957.

Card 4/4

COUNTRY : USSR
CATEGORY : Cultivated Plants. Commercial. Oleiferous. M
Sugar-Bearing.
ABS. . . . : RZhBiol., No. 1, 1959, No. 1745

AUTHOR : Zamotayl[illegible] S.S.
INST. : All-Union Sci.Res.Inst. of Oleiferous and * roductive
TITLE : Some Formation Characteristics of the Peanut Re[illegible]
Organs.

ORIG. PUB. : V sb.: Kratkiy otchet o nauchno-issled[illegible] rabote Vses. n.-i. in-ta maslichn. i efiromas[illegible]ichn. kul'tur za 1956 g. Krasnodar. "Sov. Kuban'", ** 1957, 81-86

ABSTRACT : The peanut flower di[illegible] Leguminous flowers by the presence of a hypanthium around the pistil. In the case where the stigma sinks into the hypanthium pollination of the flower can not be accomplished. Besides this phenomenon, in the morphogenesis of the peanut flower no regular infractions are noted which could be the cause for the sterility of a part of the flowers. Judging by the morphology, all peanut flowers with rare exceptions appear to be fully valuable. The initial differentiation of the first flowers in peanut sprouts occurs within 12-15

CARD: 1/2

* Essential Oil-Bearing Crops.

COUNTRY : USSR
SUBJECT : Cultivated Plants. Commercial. Oleiferous. Sugar-Bearing.
AGR. JOUR.: Sel'skoe Khozyaystvo, No. 5, 1959, No. 26417

Author : Zamotaylov, S.S.
INST. : All-Union Scientific Research Institute of
TITLE : Problem of Partial Sterility in the Peanut.

ORIG. PUB.: Agrobiologiya, 1957, No.6, 128-132

ABSTRACT : Findings of research conducted by the All-Union Scientific Research Institute of Oleiferous and Essential-Oil Bearing Crops in a cyto-embryological study of the ovaries of peanuts after flowering. A description is given of the various cases of morphologic anomaly in the ovules and embryo sacs. It is concluded that the described anomalies are the of the causes for peanut sterility.

CARD : *Oleiferous and Essential Oil Bearing Crops 1/1

ZAMOTAYLOV, S.S.

"Resting" period of the embryo in Arachis hypogaea L. Bot. zhur. 45 no.10:1435-1445 O '60. (MIRA 13:11)
(Peanuts)

ZAMOTAYLOV, S.S.

Characteristics of the fusion of germ cell nuclei in the peanut (Arachis hypogaea L.). Dokl.AN SSSR 123 no.5:941-943 D '58. (MIRA 12:1)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut maslichnykh i efiromaslichnykh kul'tur, g. Krasnodar. Predstavleno akademikom N.V. TSitsinym.
(Peanut) (Fertilization of plants)

ZAMOTAYLOV, S.S.

FD-2395

USSR/Biology - Botany

Card 1/1 Pub. 42-8/9

Author : Zamotaylov, S. S.

Title : The embryology of the fig during various modifications in pollination

Periodical : Izv. AN SSSR. Ser. Biol. 2, 103-121, March-April, 1955

Abstract : Author describes various methods of pollination and embryological work on the fig in order to accumulate embryological data for selection and genetics investigations. Drawings. Twenty two references, eleven of these from the USSR (ten after 1940).

Institution: Moscow Order of Lenin State University imeni V. M. Lomonosov, Chair of Genetics and Selection

Submitted : January 5, 1955

ZAMOTAYLOV, S.S.

Fertilization in the common nightshade. Agrobiologiia no.6:137-138 N-D '56. (MLRA 10:1)

1. Kafedra genetiki Moskovskogo gosudarstvennogo universiteta imeni M.V.Lomonosova.

(Nightshade) (Fertilization of plants)

ZAMOTIN, B.A.

Effectiveness of immunization against poliomyelitis by peroral dragee vaccine. Zhur. mikrobiol., epid. i immun. 42 no.6:144 '65.
(MIRA 18:9)

1. Kemerovskaya oblastnaya sanitarno-epidemiologicheskaya stantsiya.

DRANKIN, D.I.; ZAMOTIN, B.A.; KORZHEVA, V.S.

Epidemiology of brucellosis of the suis type. Zhur.mikrobiol. epid.i immun. 31 no.2:95-100 F '60. (MIRA 13:6)

1. Iz Kemerovskoy oblastnoy sanitarno-epidemiologicheskoy stantsii i Stalinskogo instituta usovershenstvovaniya vrachey.
(BRUCELLOSIS epidemiol.)

A L 13015-66 EWT(d)/EWT(m)/EWP(w)/EPF(n)-2/EWP(v)/T/EWP(t)/EWP(k)/EWP(b) IJP(c)

ACC NR: AT6000929 SOURCE CODE: UR/2563/65/000/251/0044/0046

AUTHOR: Ageyeva, I. N.; Zamotorin, M. (Candidate of technical sciences, Docent); Karaseva, T. S. EWP(t)/EWP(l) JD/HW/JG

ORG: Leningrad Polytechnic Institute imeni Kalinina (Leningradskiy politekhnicheskiy institut)

TITLE: Yield plateau in chromium

SOURCE: Leningrad. Politekhnicheskiy institut. Trudy. no. 251, 1965. Metallovedeniye (Metal science), 44-46

TOPIC TAGS: chromium, chromium alloy, yield stress, metal test

ABSTRACT: Room temperature compression tests were made on electrolytic chromium to study the influence of hydrogen on yield point and on yield point elongation (yield plateau). Electrolytic chromium was melted under a helium atmosphere and cast into plate form using copper molds. Compression testing was done on a Gagarin press using cylinders 6 mm wide and 9 mm high. The samples were annealed prior to testing in a vacuum (10^{-5} to 10^{-6} mm Hg), and hydrogen contents were obtained by the vacuum heating method. Data are presented in the form of compression curves after vacuum annealing at temperatures ranging from 100°C to

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ACC NR: AT6000929

600°C. No yield point elongation or bend in the curve are apparent after high temperature annealing (above about 500°C) while the yield plateau is distinctly present after annealing at 50, 100, 150, 200 and 250°C. Oxygen and nitrogen content (0.009 wt % and 0.005 wt % respectively) remained constant after vacuum annealing while the hydrogen con-

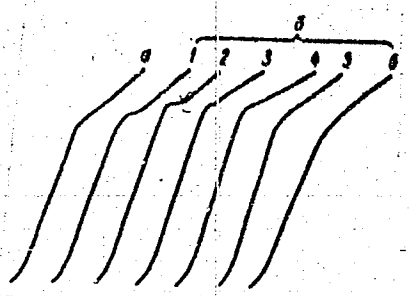

Fig. 1. Compression curves of chromium in the as-cast condition and after annealing in vacuo: a--ordinary condition; b--after annealing: 1--at 100°C; 2--at 150°C; 3--at 250°C; 4--at 300°C; 5--at 500°C; 6--at 600°C

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ACC NR: AT6000929

tent diminished with increase in annealing temperature. In alloyed chromium, yield elongation is absent and in binary alloys of Cr with Mo, Fe, Mn and Al the phenomenon was not observed. Orig. art. has: 2 figures.

SUB CODE: 11/ SUBM DATE: 00/ ORIG REF: 003/ OTH REF: 002

Card 3/3

ZAMOTORIN, M.I.

Shape of the solubility isotherm in ternary systems. Trudy LPI no. 251:5-9 '65 (MIRA 19:1)

AGEYEVA, I.N.; ZAMOTORIN, M.I.; KARASEVA, T.S.

Yield area in chromium. Trudy LPI no. 251:44-46 '65
(MIRA 19:1)

AGEYEVA, N.I.; ZAMOTORIN, N.I.

Hydrogen in nickel. Trudy IPI no. 25:50-56 '65 (MIRA 19:1)

ZAYTSEVA, L.P.; ZAMOTORIN, M.I.; SIMASHEVA, N.P.; FIDLIN, V. Ya.

Investigating the effect of electric discharge machining on the properties and structure of metals. Trudy LPI no. 251: 57-61 '65 (MIRA 19:1)

Effect of electric discharge machining on the aging processes of armco iron and aluminum alloys. Ibid.:62-69.

ZAMOTORIN, M.I. (Leningrad); ZAMOTORINA, T.M. (Leningrad)

Solubility of zirconium in aluminum in the solid state.
Izv. AN SSSR. Met. no.6:130-131 N-D '65.
(MIRA 19:1)

1. Submitted January 11, 1965.

L 13014-66 EWT(m)/EWP(w)/EWA(d)/T/ EWP(t)/EWP(k)/ EWP(z)/EWP(b) IJP(c)
ACC NR: AT6000930 MJW/JD SOURCE CODE: UR/2563/65/000/251/0062/0069

AUTHOR: Zaytseva, L. P.; Zamotorin, M. I. (Candidate of technical sciences, Docent); Simasheva, N. P.; Fidlin, V. Ya.

ORG: Leningrad Polytechnical Institute (Leningradskiy politekhnicheskiy institut)

TITLE: Effect of electric discharge processing on aging in Armco iron and aluminum alloys

SOURCE: Leningrad. Politekhnicheskiy institut. Trudy. no. 251, 1965. Metallovedeniye (Metal science), 62-69

TOPIC TAGS: aluminum alloy, iron, dispersion hardening, solid mechanical property, electric resistance, metal aging, electric discharge

ABSTRACT: A study was made of electrid discharge processing (EDP) in water and its impact on aging behavior in Armco iron, aluminum alloys--Al-Cu and Al-Mg-Si and the alloys D1T and V95. Tensile properties, hardness, impact energy, specific electrical resistance and microstructures were analyzed after various treatments. EDP was applied as follows: for Armco iron: (1) quench from 700°C (1 hr hold time) into water and natural aging for 1, 5 and 15 days; (2) same quench with supplementary EDP at room temperature immediately after, and after 1 and 5 days; (3) same quench with artificial aging at 50°C for 4 hrs; (4) same quench with EDP done at 70°C. For the aluminum alloys: similar EDP treatments and aging schedules, except that Al-3% Cu was quenched

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ACC NR: AT6000930

from 515°C and the Al-0.8% Mg-0.65% Si from 520°C; for alloy V95, same as above, except that different EDP temperatures were maintained. For D1T the treatment was the same as for the aluminum, except that quenching was at 500°C. The tensile properties for Armco iron after treatment are listed. The change in energy EDP did not affect the properties. EDP (especially at 70°C) raised both strength and hardness and caused a sharp decrease in specific electrical resistivity. These property changes were noted only after 1 day or more of natural aging. No differences could be observed between EDP and the usual quench and age treatment. The results for the aluminum alloys were similar in some respects. However, after aging for 15 days a significant lowering of hardness and an increase in impact energy was noted following EDP. The authors concluded that EDP in normally quenched alloys, and quenching in a field of electrical discharges, speeds up the decomposition process in the primary period of aging (to 1 day) but that after 5 days of aging the properties are almost identical. In some alloys, after 15 days of aging, a significant lowering in properties can be observed (strength, hardness). In dispersion hardening systems, the only effect observed was in the primary stages of aging. Orig. art. has: 5 figures, 2 tables.

SUB CODE: 11/3/ . SUBM DATE: 00/ ORIG REF: 001/ OTH REF: 000

jrn

Card 2/2

ZAMOTORIN, M. I., AND AGEYEVA, I. N.

Study of Solid Solution of Hydrogen in Iron

The nature of solid H solution, determined by hot extration, in alpha-Fe was studied. Optical methods were applied in studying the lattice period and the intensities of interference lines. It was found that H dissolving in Fe increases the dimensions of the elementary alpha-Fe cells. (RZhFiz, No. 8, 1955) Tr. Leningr. Politekhn. in-ta, No. 6, 1953, 67-71.

SO: Sum. No. 744, 8 Dec 55 - Supplementary Survey of Soviet Scientific Abstracts (17)

PROCESSES AND PROPERTIES INDEX

a-1

Diffusion of admixtures into steel, and the cellular theory of the structure of metals. N. Ageev and M. Zamotorin (Ann. Inst. Polytech. Leningrad, Sect. Math. Phys. Sci., 1935, 31, 15—28).—In the solid state the degree of penetration decreases as follows: 1000°, C, Pt, Fe–Mo, B, Fe–W, WC, Ni, Fe–Au, Mn, Fe–B, Co, Fe–Ti, Fe–Cr, Cr, V, Fe–Si, Fe–Mn, Fe–V, Si, W, Ti; 1200°, Fe–Si, Mo, Rh, Fe–Mn, Pd, Ru. In the liquid state at 1000° diffusion was observed with Al, Cu, and Sn, but not with Ag, Bi, Te, Pb, or Ca; at 1200° it was not observed with Ba or Li. At 750° diffusion of Zn, but not of Cd, was observed.

CHEMICAL ABSTRACTS.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

ACC NR: AT7004522 SOURCE CODE: UR/2563/66/000/268/0071/0075

AUTHOR: Zamotorin, M.I. (Docent, Candidate of technical sciences); Morozova, N.G.

ORG: none

TITLE: Effect of mischmetal on the properties of magnesium-zinc alloys

SOURCE: Leningrad. Politeknnicheskiy institut. Trudy, no. 268, 1966. Metallovendeniye (Metal sciences), 71-75

TOPIC TAGS: magnesium ~~zinc~~ alloy, ~~mischmetal containing alloy~~, ~~alloy strength~~, ~~alloy~~ ductility, ~~alloy hardness~~ zinc alloy, metal property

ABSTRACT: Ingots of magnesium alloys containing 1—7% Zn, 1—3% mischmetal (which consisted of 96—97% rare-earth metals (REM) including 60% Ce, 1.4—1.7% Fe and 0.13—0.14% Si) were extruded into 11 mm rods at 300—200°C and aged at 175°C for 48 hr. The rods were tested for mechanical properties at 20 and 250°C. Additions of up to 1% mischmetal had almost no effect on the alloy tensile strength and ductility. However, the alloys had a sufficiently high room-temperature tensile strength (27.0—24.0 kg/mm^2), yield strength (16.0—21.0 kg/mm^2), and elongation (20.5—17.5%). Increasing the mischmetal content to 3%

Card 1/2 UDC: 669.018.1

ACC NR: AT7004522

lowered the tensile and yield strengths to 25—21 and 18.5—15.5 kg/mm^2, respectively, and the elongation to 13.0—11.0%. At 250°C, alloys with 1.0 and 3.0% mischmetal had relatively high tensile and yield strengths of about 11.0—14.0 and 9.5—12.5 kg/mm^2, respectively, at a respective elongation of 43 and 33.5%. The alloy containing 2% Zn and 3% mischmetal had the best combination of mechanical properties: a tensile strength of 22 and 14.5 kg/mm^2, a yield strength of 12.0 kg/mm^2, and an elongation of 12 and 34% at 20 and 250°C, respectively. An alloy of the same composition had satisfactory heat and oxidation resistance and an HB hardness of 30 and 8.6 kg/mm^2 in 100-hr tests at 20 and 250°C, respectively. Orig. art. has: 1 figure and 3 tables. [MS]

SUB CODE: 11/ SUBM DATE: none/ ATD PRESS: 5116

Card 2/2

BUTOMO, D.G.; ZAMOTORIN, M.I.; ZEDIN, N.I.; SOMOVA, Ye.P.

Earing of copper strip. TSvet. met. 36 no.7:77-81 Jl '63.
(MIRA 16:8)

(Copper) (Rolling (Metalwork))

S/563/62/000/218/001/004
E111/E483

AUTHOR: Zamotorin, M.I.

TITLE: Short-range order and properties of primary solid solutions

SOURCE: Leningrad. Politekhnicheskiy institut. Trudy. no.218. Moscow, 1962. Metallovedeniye, 7-21

TEXT: The author showed in earlier work that short-range order is established in the primary solutions of Al-Mg-Cu, Al-Mg-Zn and Al-Mg-Ag alloys with their components present in ratios corresponding to the compositions of intermetallic compounds which are in equilibrium with the appropriate solid solutions. In this paper the effect was studied of short-range order in such alloys on: a) the energy of formation of thermal vacancies in the lattice, b) the relative contribution of static and dynamic disturbances to the electrical resistance of the alloys and c) the decomposition of the solid solutions. The first part of the problem was studied (by the volumetric analysis method) on alloys of the Al-Mg-Cu and Al-Mg-Zn systems. These and other results indicated that the energy of formation of thermal

Card 1/3

Short-range order ...

vacancies in the lattice varies with the composition of the solid solution and is higher in alloys with short-range order than in those with a random distribution of the component atoms. The second part of the problem was investigated by measuring the electrical resistivity ρ of Al-Mg-Cu and Al-Mg-Ag alloys at -195.67, 0, 25 and 450°C. The results of this series of experiments led to the conclusion that the electrical resistivity component associated with static lattice defects is very small in comparison with that due to dynamic disturbances. Thus, for instance, at 25°C electrical resistivity due to static disturbances constitutes only 16% of the total, decreasing to less than 7% at 450°C. It was found also that the temperature coefficient of electrical resistivity increases in alloys with short-range order and decreases when this order is destroyed owing to the presence of excess solute (Mg or Ag) atoms. Finally, the decomposition of solid solutions in relation to short-range order was studied by carrying out hardness and electrical resistivity measurements during natural and artificial ageing of Al-Mg-Ag and Al-Mg-Cu alloys. The general conclusion reached was that

Short-range order ... S/563/62/000/218/001/004
E111/E483

owing to chemical interaction between the component atoms and establishment of short-range order in ternary solid solutions, their properties differ considerably from those of binary solid solutions. The decomposition of binary alloys at room temperature (natural ageing) is very slow and the resultant changes in their properties are insignificant. In contrast, ternary alloys age readily and the properties of aged alloys of compositions, corresponding to intermetallic compounds AlMgAg, Al_2MgCu and Al_6Mg_4Cu, attain their extreme values. The results obtained indicate clearly that decomposition of the alloys studied is preceded by the onset of short-range order in the form of atom aggregates corresponding to the composition of the appropriate intermetallic compounds. There are 20 figures and 4 tables.

Card 3/3

S/563/62/000/218/002/004
E071/E135

AUTHORS: Zamotorin, M.I., and Pal', Ye.Ye.

TITLE: Influence of small additions on the ageing and properties of Al-Mg-Zn-Cu alloys

SOURCE: Leningrad. Politekhnicheskiy institut. Trudy. no.218. Moscow, 1962. Metallovedeniye. 50-54.

TEXT: The influence was studied of small additions of boron, mischmetal, silver and zirconium on the ageing and mechanical properties of an aluminium alloy of the B 95 (V95) type (7.3% Zn, 2.7% Mg, 0.5-0.75% Cu and 0.5% Mn) (primary crystallisation, plastic properties of cast alloys at various temperatures, natural and artificial ageing of deformed alloys). Additions of boron, mischmetal and zirconium diminish the grain size, inhibit the development of transcrystallisation, and improve considerably the impact strength of cast alloys at elevated temperatures; peak values of about 2.1 kgm/cm^2 for 0.025% B and 1.42 kgm/cm^2 for 0.5% mischmetal were obtained at about 350 °C. Boron and mischmetal have hardly any influence on the strength in the annealed

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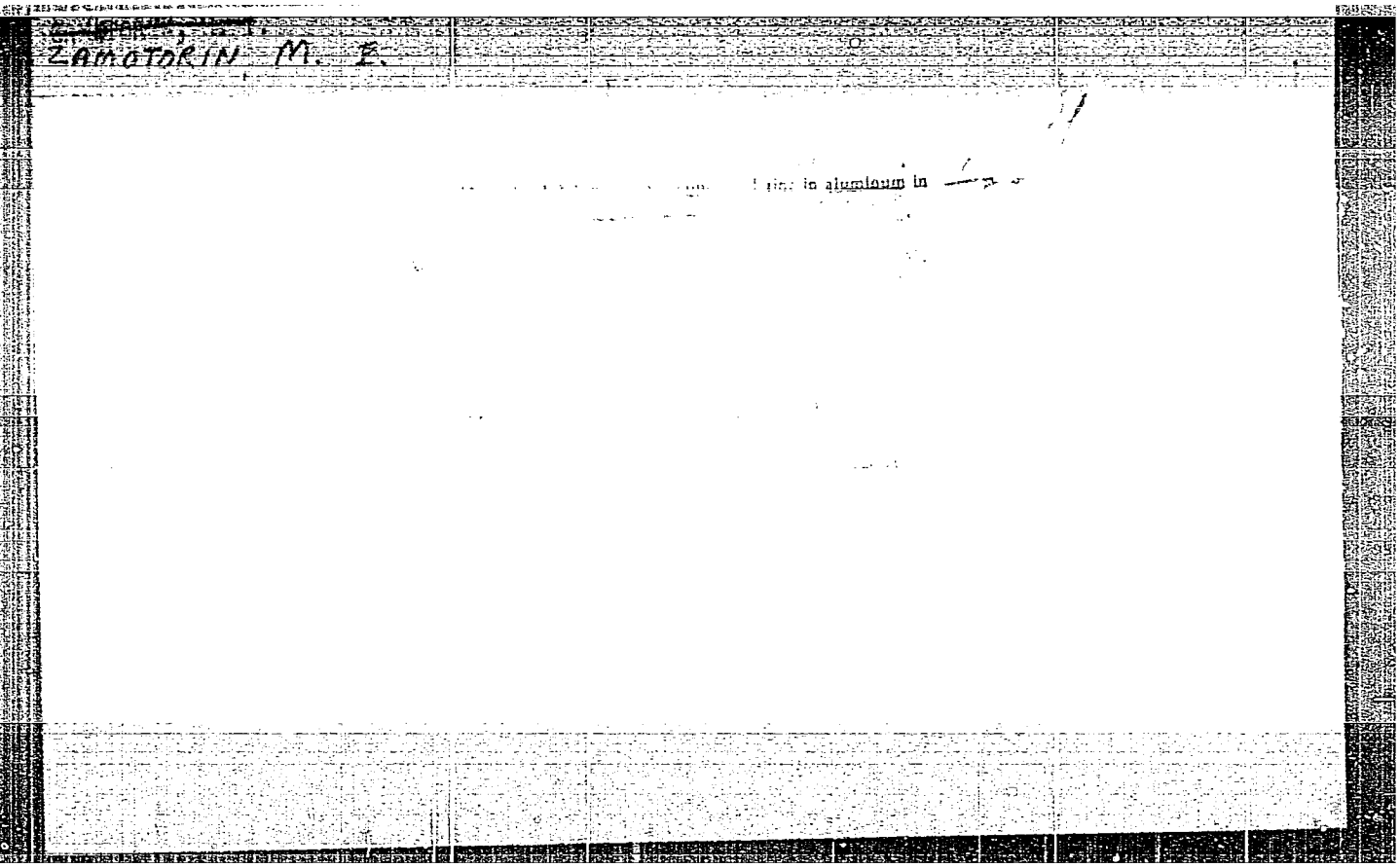
and hardened states. Silver increases slightly the strength in the hardened state, zirconium increases the strength in the annealed and hardened states but particularly in the hardened state. Zirconium lowers the elongation. Additions of boron, mischmetal, silver and zirconium have little influence on the process of natural and artificial ageing.
There are 8 figures and 1 table.



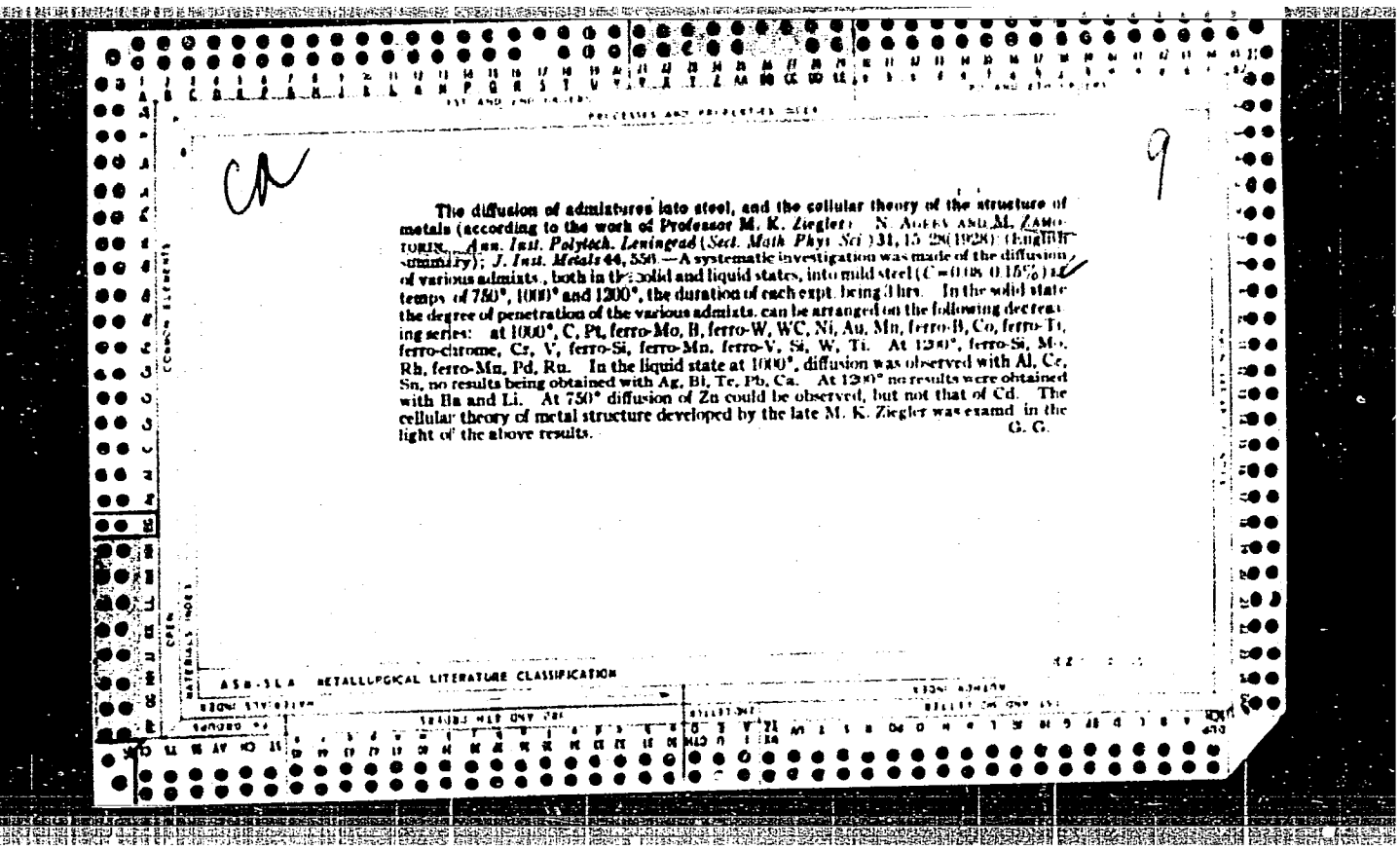
ZAMOTORIN, M.I.

4

USSR

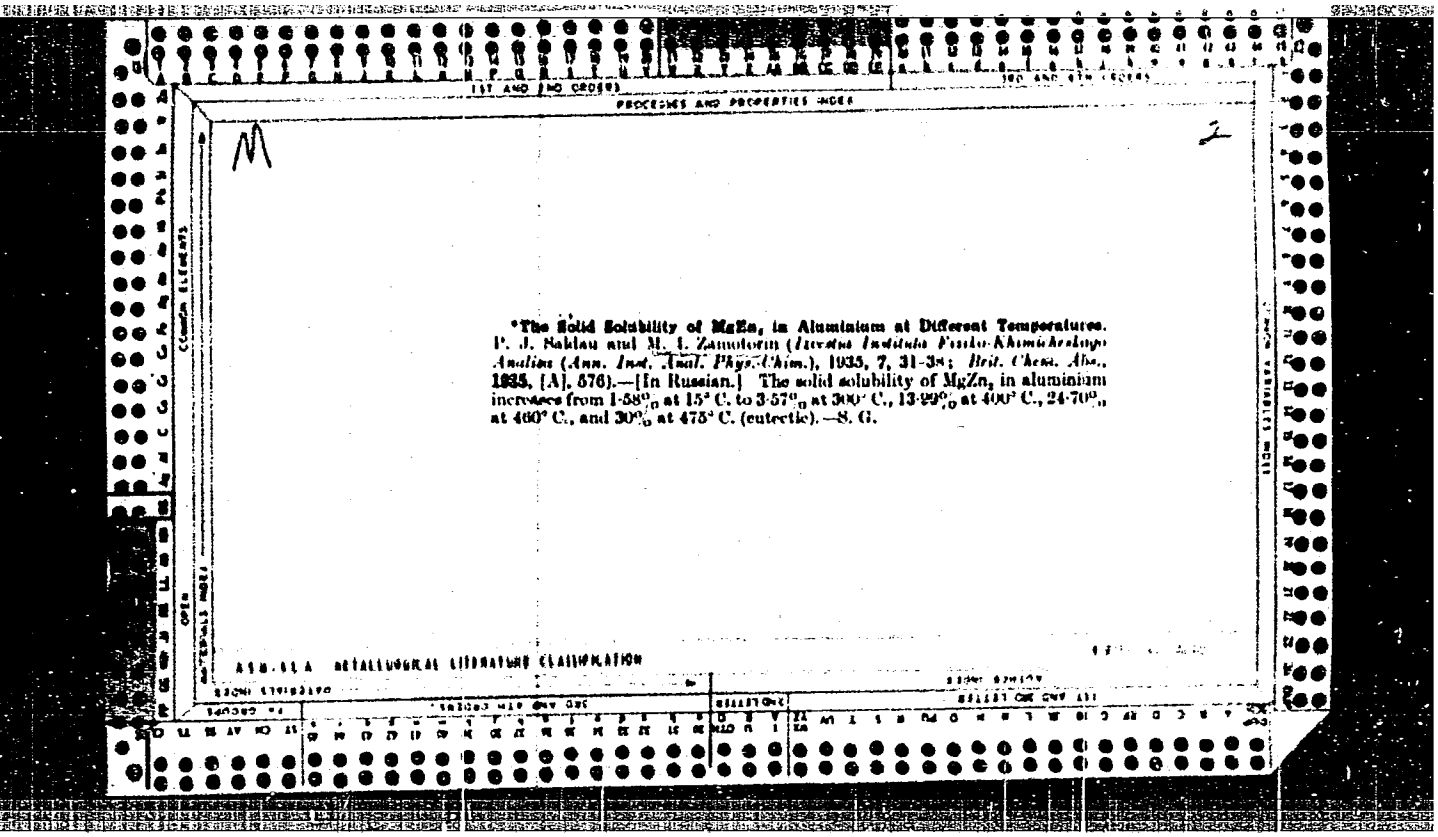
The solution of electrolytically evolved hydrogen in iron. Yu. V. Baimakov and M. I. Zamotorin (S. T. Kalinin Polytech. Inst., Leningrad). *Trudy Soveshchaniyu Elektrokhim., Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* 1950, 125-37(1953).—The nature of dissolved H and the mechanism of its soln. were studied in electrodeposited Fe (I) and steel (C 0.09-0.15, Mn 0.35-0.50%) (II). I was produced at 20, 60, 100, and 110° from a soln. contg. 50 or 100 g. Fe per l. as $FeCl_2$, freed from sulfate by means of BaCl. H was detd. by heating under vacuum and collecting the evolved gas. In I, the H varied from 10 to 13 at. %; it occurred partly as adsorbed H, but chiefly in solid soln. The presence of H in I was indicated by a lowering of the exchange current, a more noble electrode potential, and greater ease of passivation. Electrolytically produced H dissolved to a much smaller extent in II, but elastic properties were still affected. The amt. of H dissolving in II decreased with pH to essentially 0 at pH 14. At pH 0.1, the quantity of H adsorbed and in solid soln. approached 0.5 at. %, while mol. H, found in voids between crystals, was approx. 0.1 at. %. Essentially all the H in II escaped within 5 days at room temp. or 4 hrs. at 100–120°.

R. D. Misch



The diffusion of admixtures into steel, and the cellular theory of the structure of metals (according to the work of *Professor* M. K. Ziegler). N. AGEEV AND M. ZAMOTORIN. *Ann. Inst. Polytech. Leningrad* (*Sect. Math Phys. Sci.*) 31, 15–28 (1928) (English summary); *J. Inst. Metals* 44, 556.—A systematic investigation was made of the diffusion of various admixts., both in the solid and liquid states, into mild steel (C = 0.08–0.15%) at temps. of 750°, 1000° and 1200°, the duration of each expt. being 3 hrs. In the solid state the degree of penetration of the various admixts. can be arranged in the following decreasing series: at 1000°, C, Pt, ferro-Mo, B, ferro-W, WC, Ni, Au, Mn, ferro-B, Co, ferro-Ti, ferro-chrome, Cr, V, ferro-Si, ferro-Mn, ferro-V, Si, W, Ti. At 1200°, ferro-Si, Mo, Rh, ferro-Mn, Pd, Ru. In the liquid state at 1000°, diffusion was observed with Al, Ce, Sn, no results being obtained with Ag, Bi, Te, Pb, Ca. At 1200° no results were obtained with Ba and Li. At 750° diffusion of Zn could be observed, but not that of Cd. The cellular theory of metal structure developed by the late M. K. Ziegler was examd. in the light of the above results.

G. G.



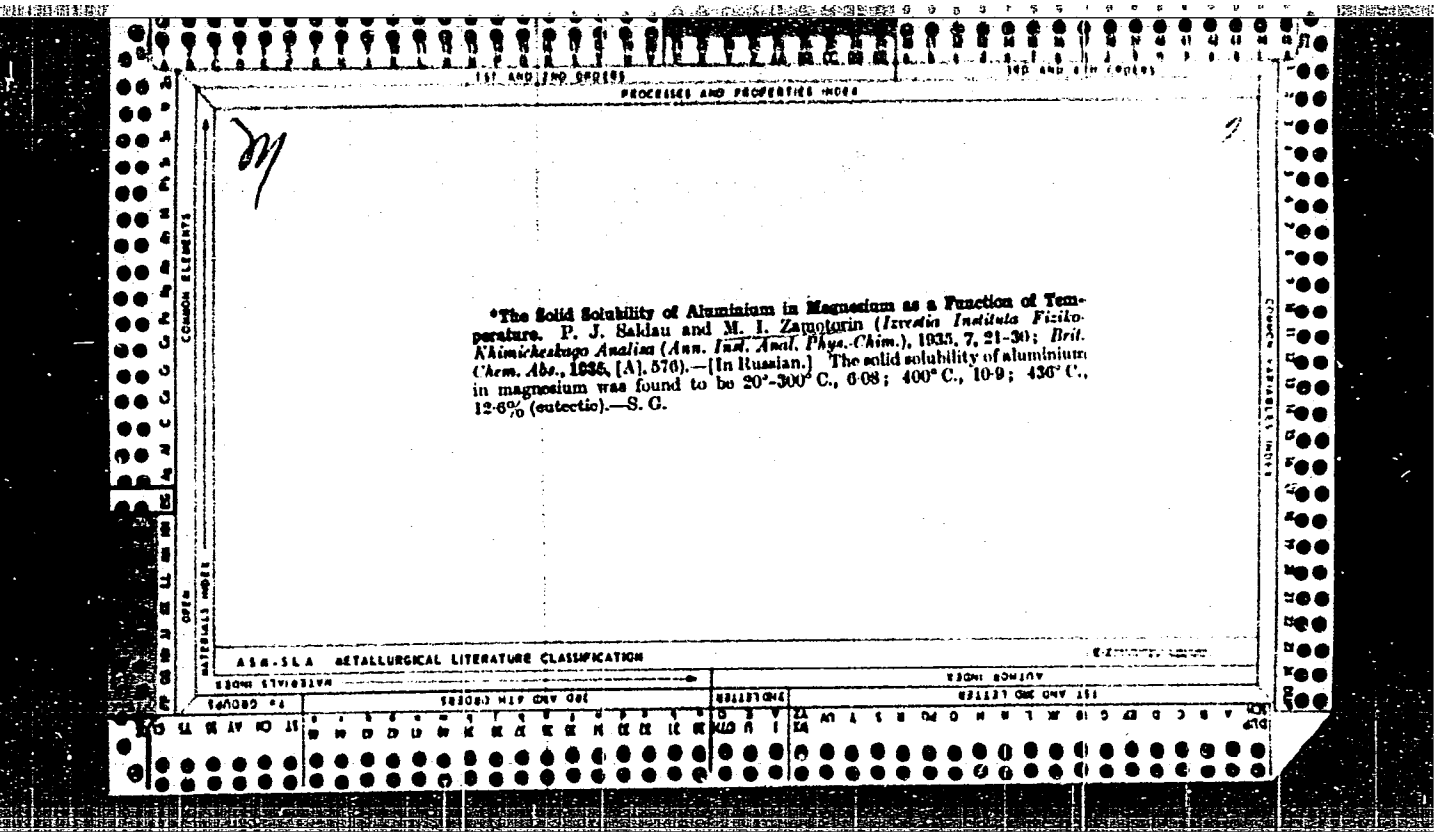
PROCESSES AND PROPERTIES INDEX

M

2

The Solid Solubility of $MgZn_2$ in Aluminium at Different Temperatures. P. J. Saklau and M. I. Zamotorin (*Izvestia Institute Fiziko-Khimicheskogo Analiza* (*Ann. Inst. Anal. Phys.-Chim.*), 1935, 7, 31-38; *Brit. Chem. Abs.*, **1935**, [A], 576).—[In Russian.] The solid solubility of $MgZn_2$ in aluminium increases from 1·58% at 15° C. to 3·57% at 300° C., 13·99% at 400° C., 24·70% at 460° C., and 30% at 475° C. (eutectic).—S. G.

ASM-ASLA METALLURGICAL LITERATURE CLASSIFICATION



*The Solid Solubility of Aluminium in Magnesium as a Function of Temperature. P. J. Saklau and M. I. Zamoturin (*Izvestia Instituta Fiziko-Khimicheskago Analiza* (*Ann. Inst. Anal. Phys.-Chim.*), 1935, 7, 21–30; *Brit. Chem. Abs.*, 1935, [A], 576).—[In Russian.] The solid solubility of aluminium in magnesium was found to be 20°–300° C., 6·08; 400° C., 10·9; 436° C., 12·6% (eutectic).—S. G.

ZAMOTORIN, M.I.,
B. LAKUTIN, Novosti Tekhniki 1937, No. 16, 2-3.

CA

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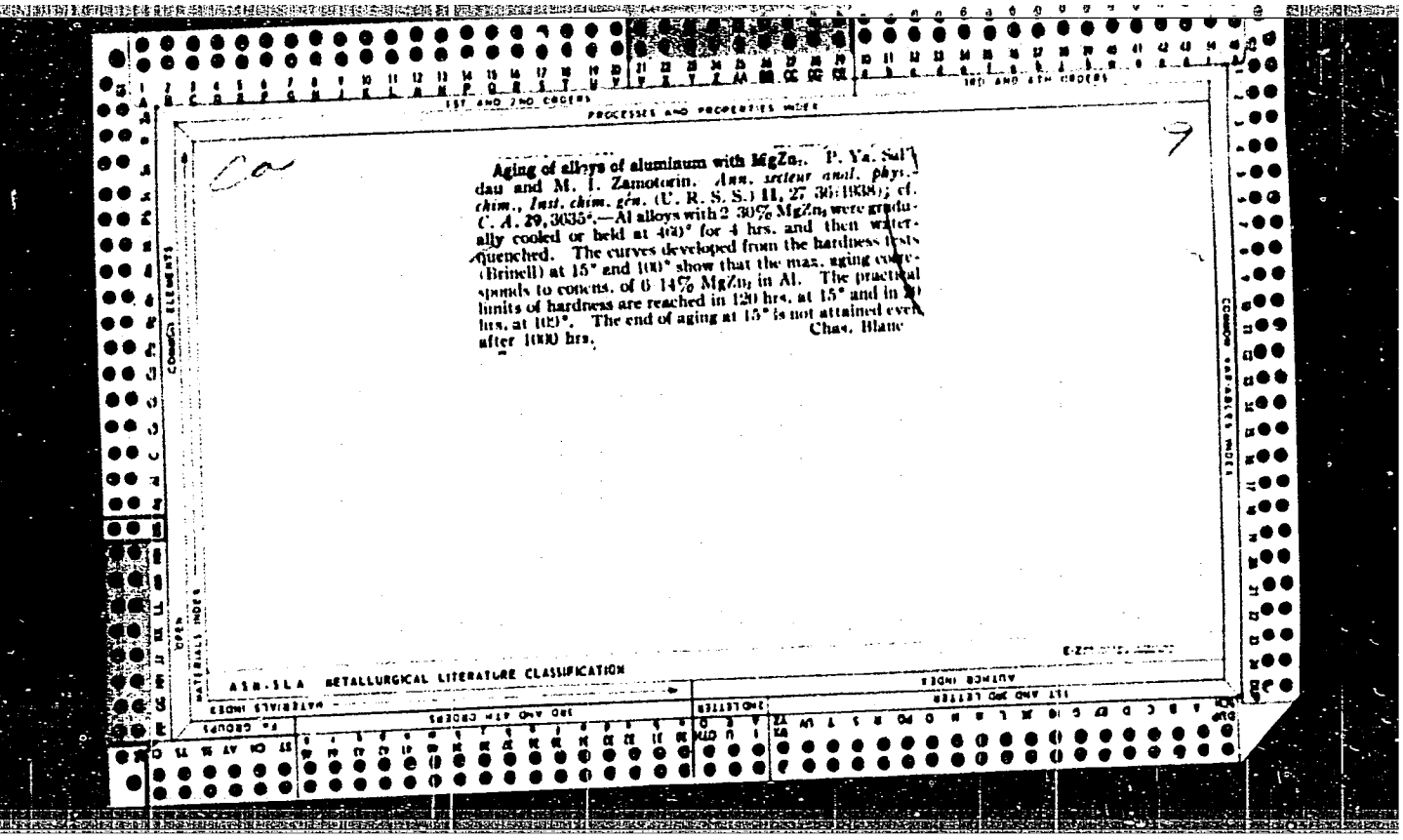
PROCESSES AND PROPERTIES INDEX

Solubility of aluminum in magnesium in solid state at various temperatures. P. Ya. Sal'dau and M. I. Zamotorin—*Izv. inst. anal. phys.-chim.* (U. S. S. R.) 7, 21-30 (1935); cf. S. and Sergeev, C. A. 29, 92°.—Mg alloys contg. 5.07–13.15% Al were held at 420° for 14 days, then cooled within 4 hrs. to definite temps., held at these temps. for 24 hrs. and water quenched. The curves developed from the microscopic examn. show the following solubilities of Al in Zn: 15 300° 0.08, 400° 10.0%, and at 430° the eutectic line is crossed with 12.0% Al in Zn.

Chas. Blanc

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



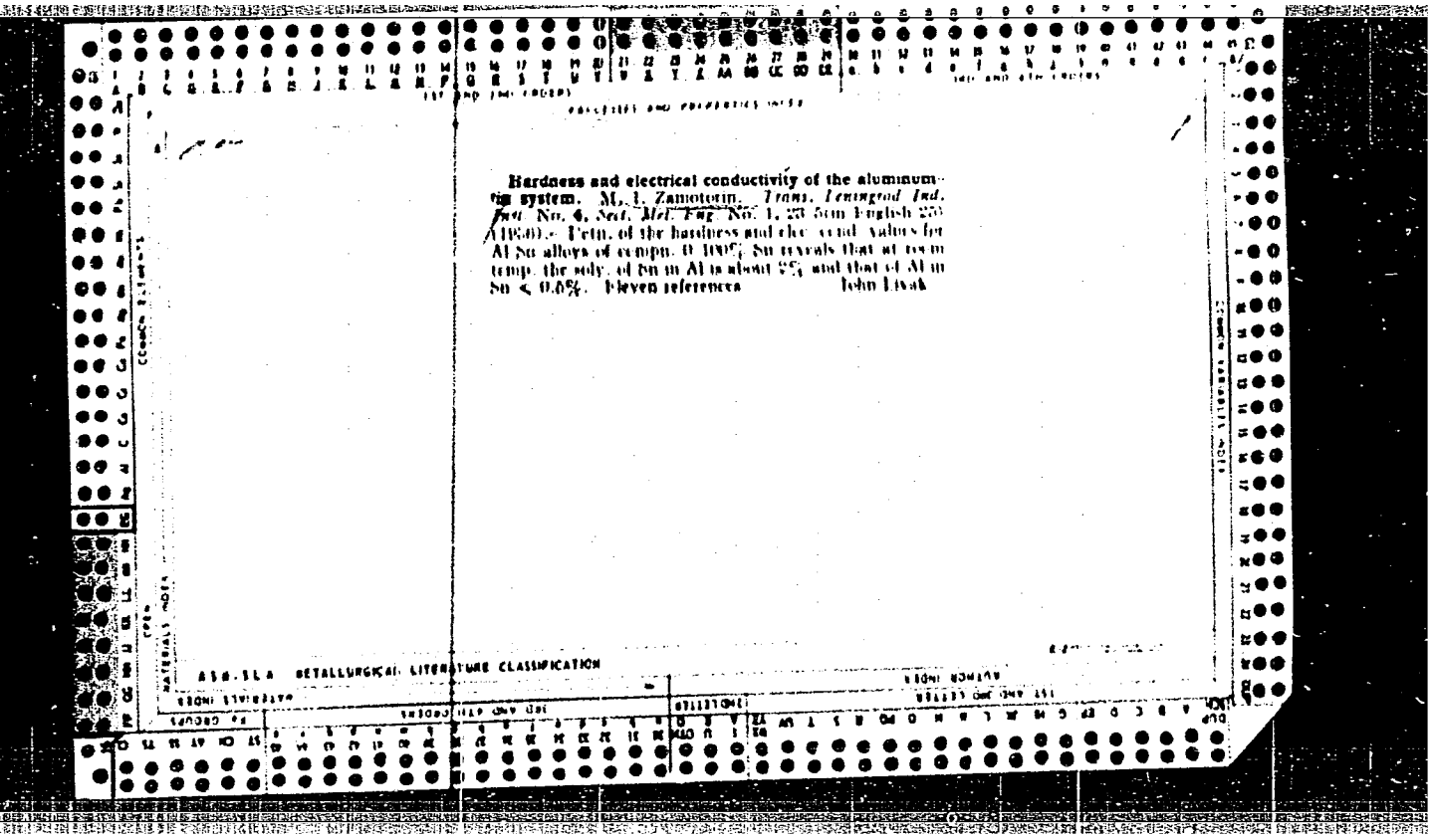
Ca

7

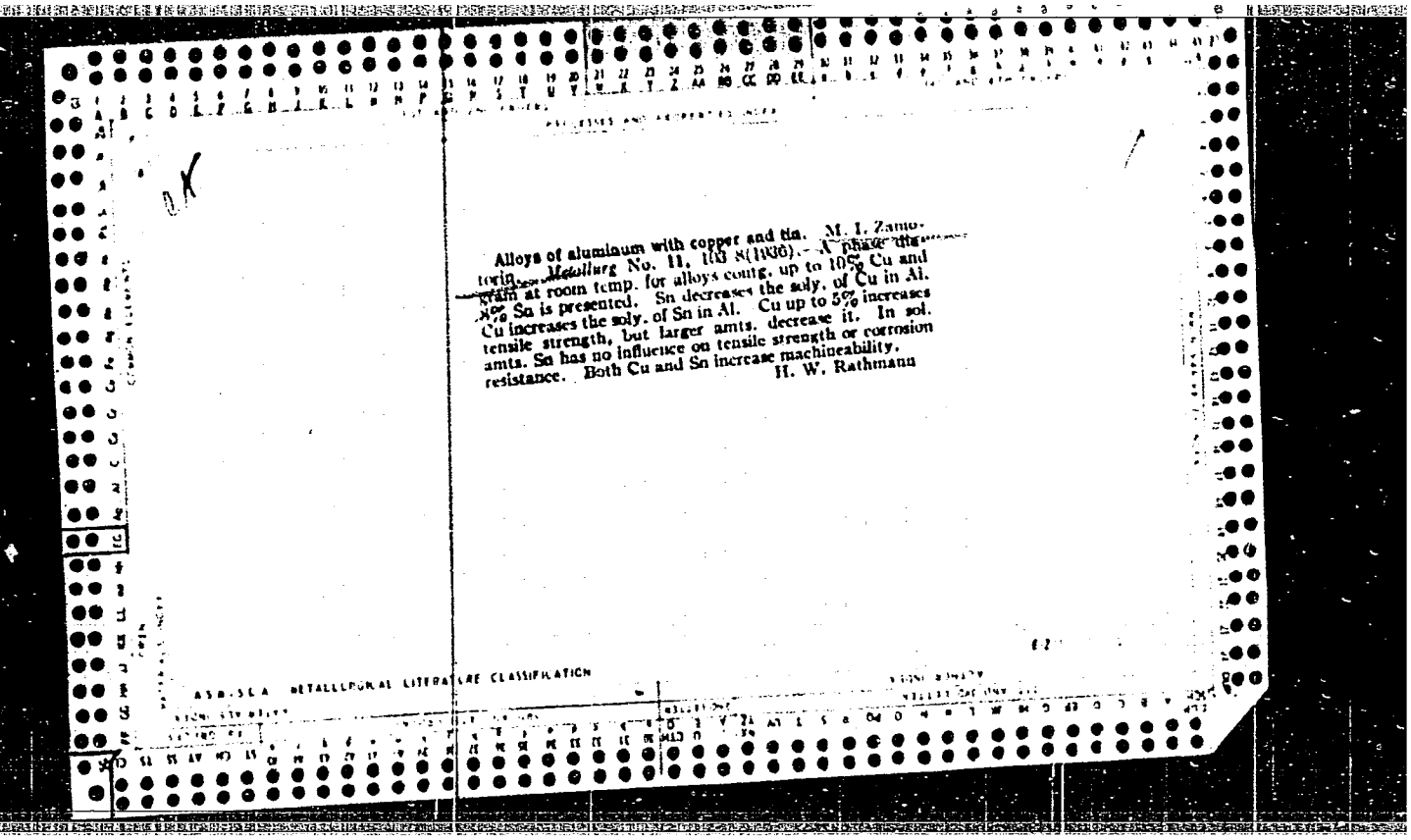
Aging of alloys of aluminum with $MgZn_2$. P. Ya. Salt'dau and M. I. Zamotorin. *Ann. secteur anal. phys.-chim., Inst. chim. gén.* (U. R. S. S.) **11**, 27-36 (1938); cf. *C. A.* **29**, 3035⁶.—Al alloys with 2-30% $MgZn_2$ were gradually cooled or held at 400° for 4 hrs. and then water-quenched. The curves developed from the hardness tests (Brinell) at 15° and 100° show that the max. aging corresponds to concns. of 6-14% $MgZn_2$ in Al. The practical limits of hardness are reached in 120 hrs. at 15° and in 20 hrs. at 100°. The end of aging at 15° is not attained even after 1000 hrs.

Chas. Blanc

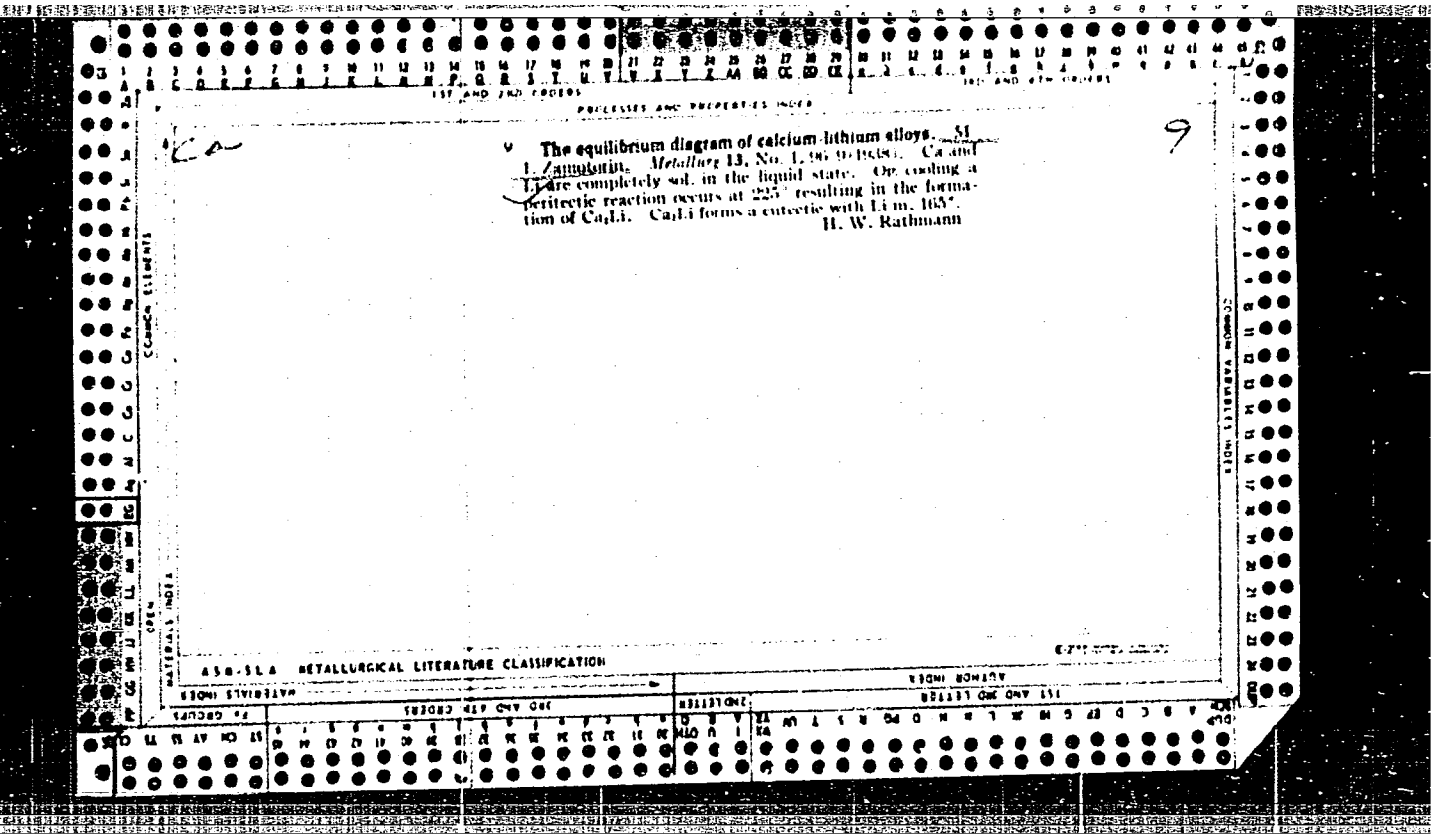
ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



Hardness and electrical conductivity of the aluminum-tin system. M. I. Zamotorin. *Trans. Leningrad Ind. Inst.* No. 6, *Sect. Met. Eng.* No. 1, 23–5 (in English 25) (1940).—Detn. of the hardness and elec. cond. values for Al-Sn alloys of compn. 0–100% Sn reveals that at room temp. the sol. of Sn in Al is about 2% and that of Al in Sn < 0.6%. Eleven references John Livak

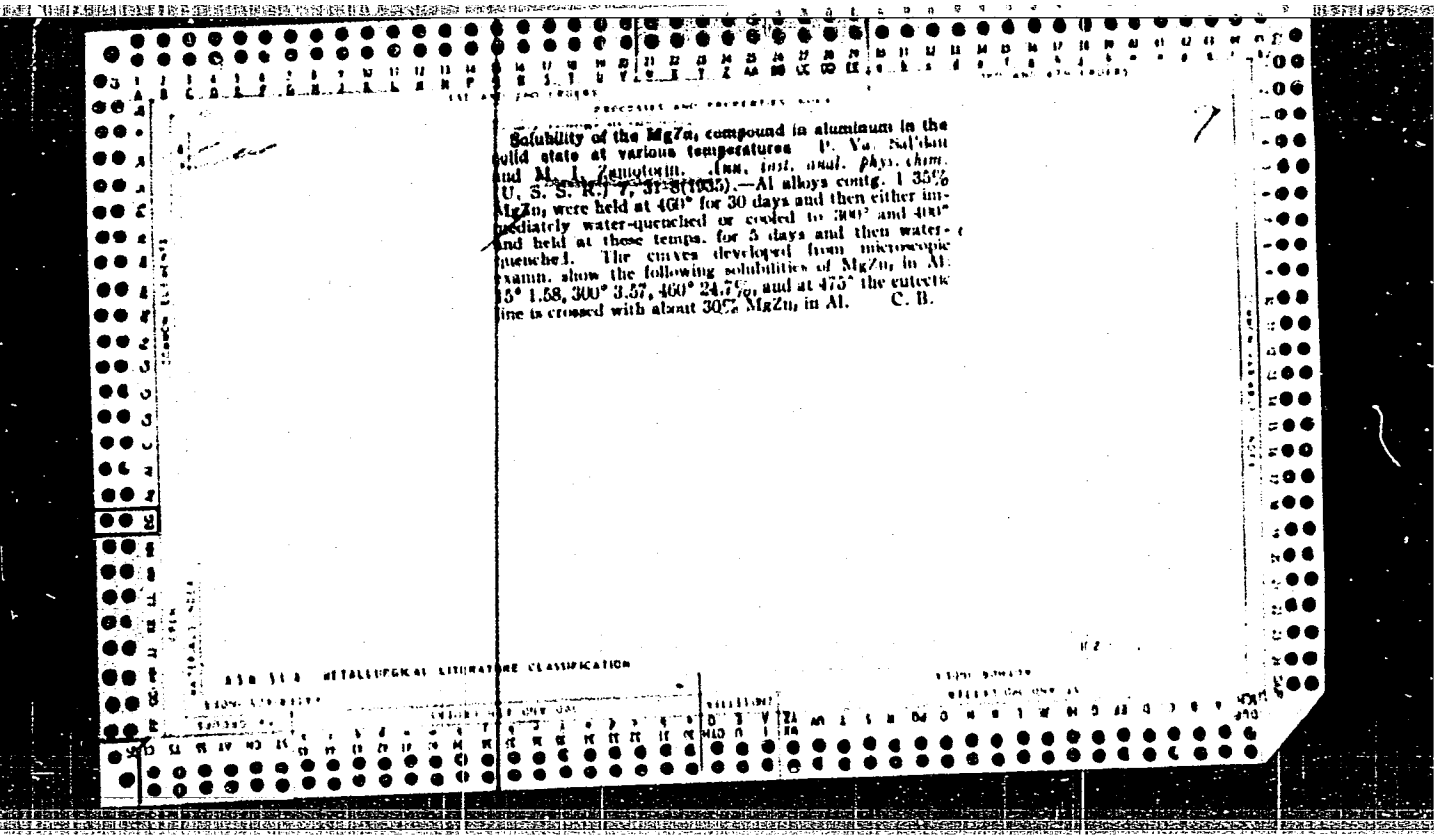


Alloys of aluminum with copper and tin. M. I. Zamo-
torin. *Metallurg* No. 11, 103-8(1936).—A phase dia-
gram at room temp. for alloys contg. up to 10% Cu and
.8% Sn is presented. Sn decreases the sol'y. of Cu in Al.
Cu increases the sol'y. of Sn in Al. Cu up to 5% increases
tensile strength, but larger amts. decrease it. In sol.
amts. Sn has no influence on tensile strength or corrosion
resistance. Both Cu and Sn increase machineability.
H. W. Rathmann

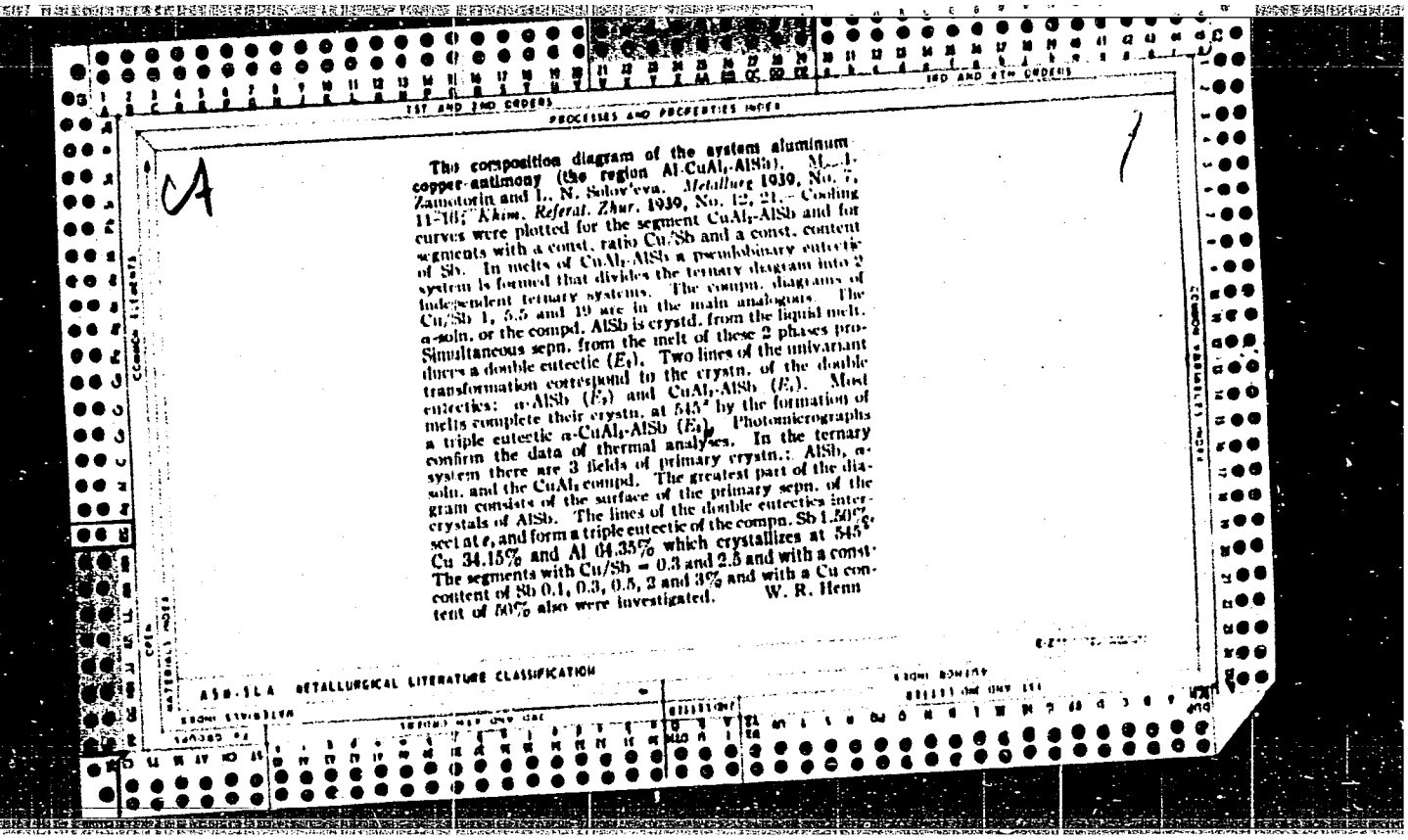


The equilibrium diagram of calcium-lithium alloys. 51
I. Zamalutin. *Metallurg* 13, No. 1, 95-9 (1938). Ca and Li are completely sol. in the liquid state. On cooling a peritectic reaction occurs at 225° resulting in the formation of Ca_2Li. $CaLi$ forms a eutectic with Li m. 165°.
H. W. Rathmann

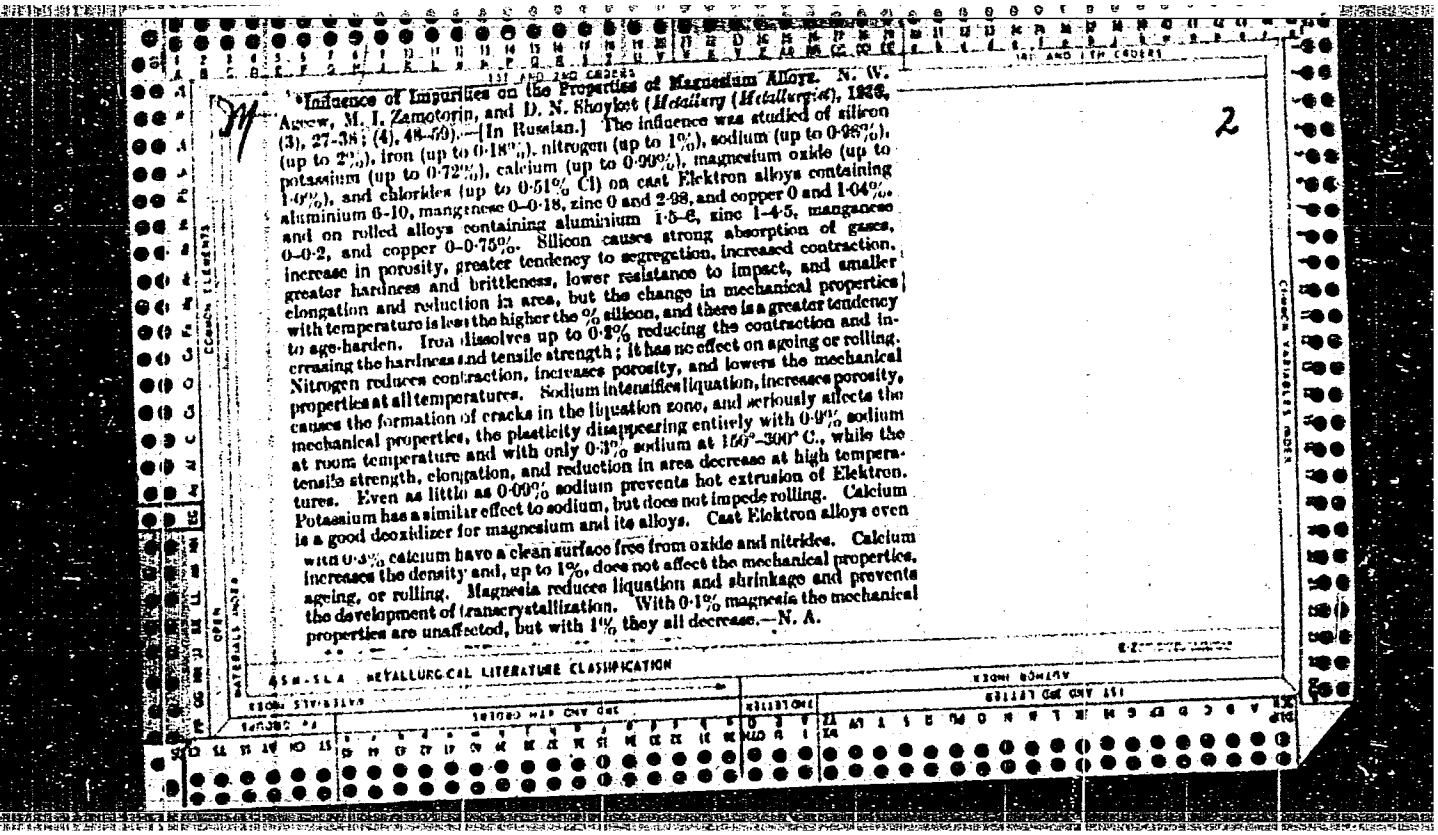
ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



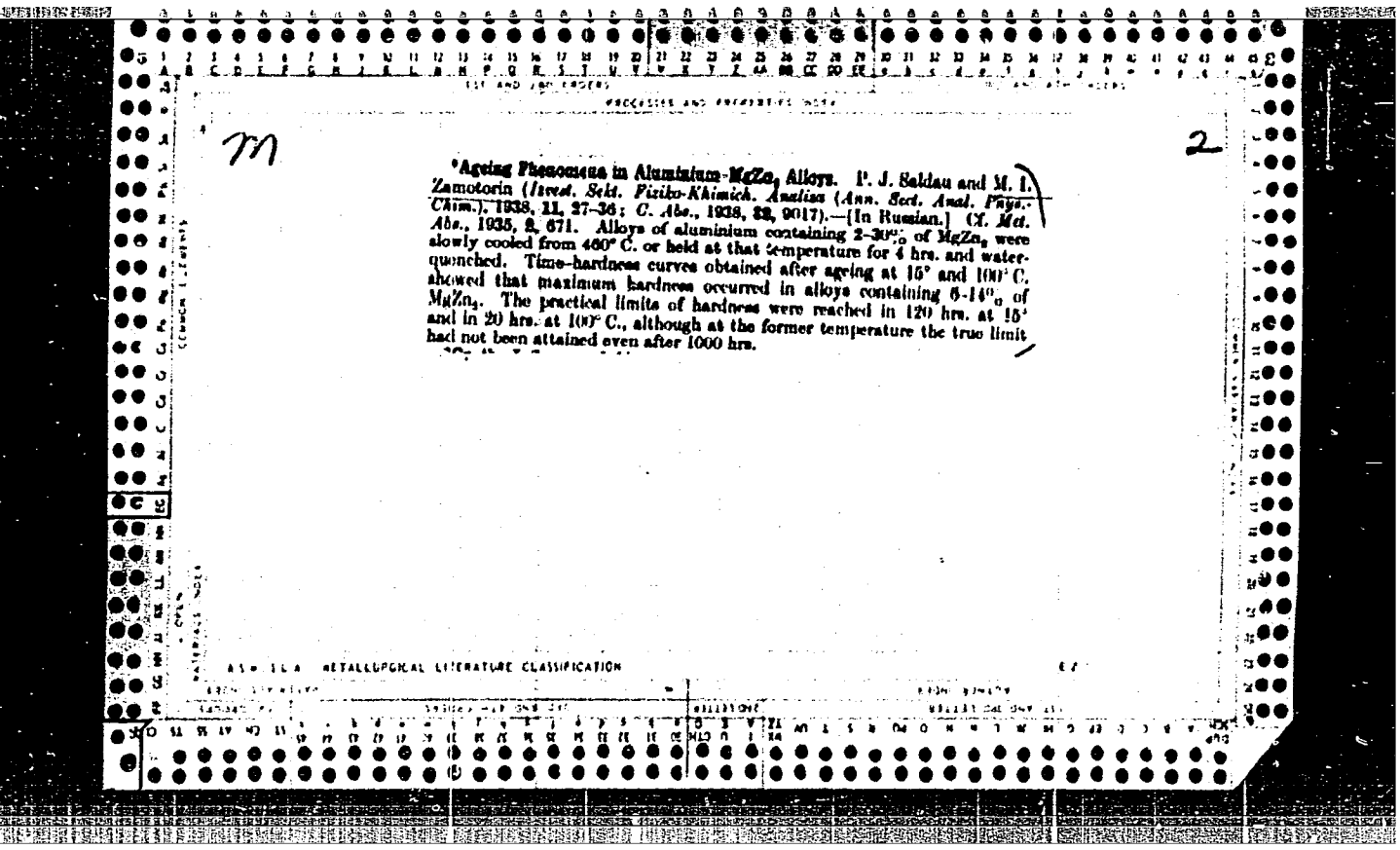
Solubility of the $MgZn_2$ compound in aluminum in the solid state at various temperatures. P. Ya. Sal'tikov and M. I. Zamotorin. (Inst. inst. anal. phys. chim. U. S. S. R.) *J. Phys. Chem. (U.S.S.R.)* 7, 31-8(1935).—Al alloys contg. 1.35% $MgZn_2$ were held at 460° for 30 days and then either immediately water-quenched or cooled to 300° and 400° and held at these temps. for 5 days and then water-quenched. The curves developed from microscopic examn. show the following solubilities of $MgZn_2$ in Al: 35° 1.58, 300° 3.57, 460° 24.7%, and at 475° the eutectic line is crossed with about 30% $MgZn_2$ in Al. C. B.



The composition diagram of the system aluminum-copper-antimony (the region Al-CuAl$_2$-AlSb). M. I. Zamotorin and L. N. Solov'eva. *Metallurg* 1939, No. 7, 11-16; *Khim. Referat. Zhur.* 1939, No. 12, 21.—Cooling curves were plotted for the segment CuAl$_2$-AlSb and for segments with a const. ratio Cu/Sb and a const. content of Sb. In melts of CuAl$_2$-AlSb a pseudobinary eutectic system is formed that divides the ternary diagram into 2 independent ternary systems. The compn. diagrams of Cu/Sb 1, 5.5 and 19 are in the main analogous. The α-soln. or the compd. AlSb is crystd. from the liquid melt. Simultaneous sepn. from the melt of these 2 phases produces a double eutectic (E_3). Two lines of the univariant transformation correspond to the crystn. of the double eutectics: α-AlSb (E_3) and CuAl$_2$-AlSb (E_1). Most melts complete their crystn. at 545° by the formation of a triple eutectic α-CuAl$_2$-AlSb (E_2). Photomicrographs confirm the data of thermal analyses. In the ternary system there are 3 fields of primary crystn.: AlSb, α-soln. and the CuAl$_2$ compd. The greatest part of the diagram consists of the surface of the primary sepn. of the crystals of AlSb. The lines of the double eutectics intersect at e, and form a triple eutectic of the compn. Sb 1.50%, Cu 34.15% and Al 64.35% which crystallizes at 545°. The segments with Cu/Sb = 0.3 and 2.5 and with a const. content of Sb 0.1, 0.3, 0.5, 2 and 3% and with a Cu content of 50% also were investigated. W. R. Henn



"Influence of Impurities on the Properties of Magnesium Alloys. N. V. Agnew, M. I. Zamotorin, and D. N. Shoykot (*Metallurg (Metallurgist)*, 1938, (3), 27-38; (4), 48-59).—[In Russian.] The influence was studied of silicon (up to 2%), iron (up to 0·18%), nitrogen (up to 1%), sodium (up to 0·98%), potassium (up to 0·72%), calcium (up to 0·99%), magnesium oxide (up to 1·0%), and chlorides (up to 0·51% Cl) on cast Elektron alloys containing aluminium 6-10, manganese 0–0·18, zinc 0 and 2·98, and copper 0 and 1·04% and on rolled alloys containing aluminium 1·5–6, zinc 1–4·5, manganese 0–0·2, and copper 0–0·75%. Silicon causes strong absorption of gases, increase in porosity, greater tendency to segregation, increased contraction, greater hardness and brittleness, lower resistance to impact, and smaller elongation and reduction in area, but the change in mechanical properties with temperature is less the higher the % silicon, and there is a greater tendency to age-harden. Iron dissolves up to 0·2% reducing the contraction and increasing the hardness and tensile strength; it has no effect on ageing or rolling. Nitrogen reduces contraction, increases porosity, and lowers the mechanical properties at all temperatures. Sodium intensifies liquation, increases porosity, causes the formation of cracks in the liquation zone, and seriously affects the mechanical properties, the plasticity disappearing entirely with 0·9% sodium at room temperature and with only 0·3% sodium at 150°–300° C., while the tensile strength, elongation, and reduction in area decrease at high temperatures. Even as little as 0·09% sodium prevents hot extrusion of Elektron. Potassium has a similar effect to sodium, but does not impede rolling. Calcium is a good deoxidizer for magnesium and its alloys. Cast Elektron alloys even with 0·3% calcium have a clean surface free from oxide and nitrides. Calcium increases the density and, up to 1%, does not affect the mechanical properties, ageing, or rolling. Magnesia reduces liquation and shrinkage and prevents the development of transcrystallization. With 0·1% magnesia the mechanical properties are unaffected, but with 1% they all decrease.—N. A.

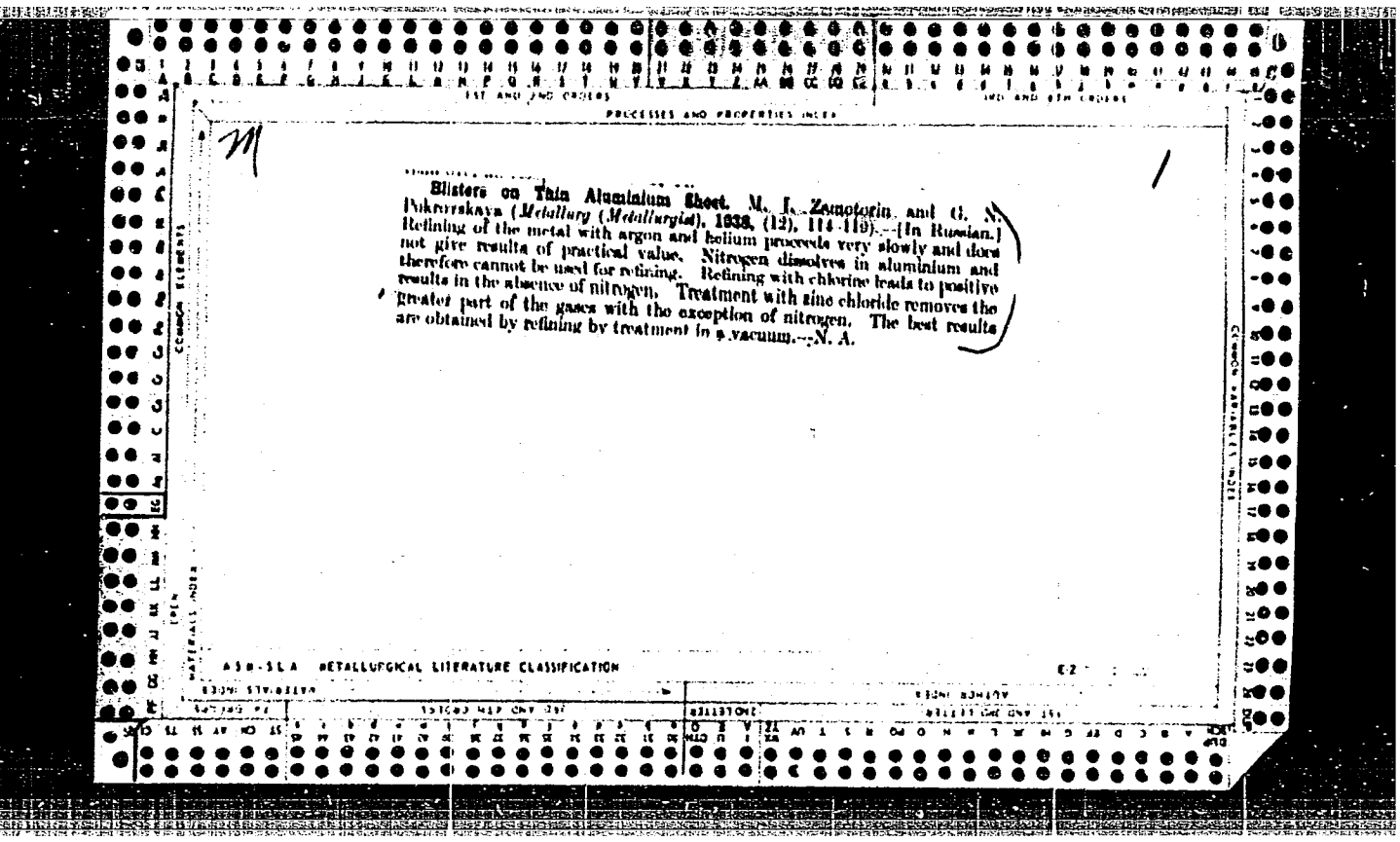


M

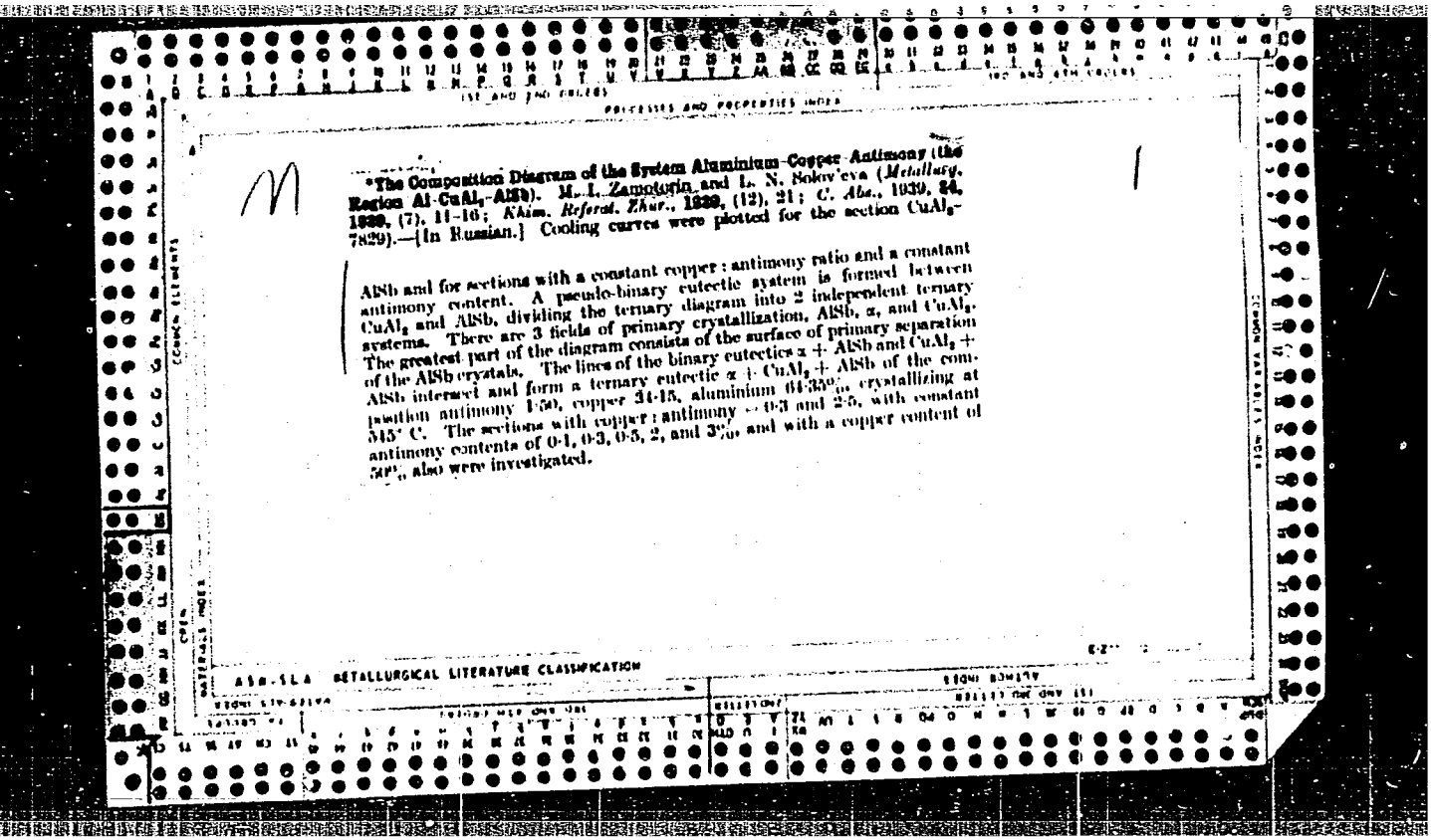
2

Ageing Phenomena in Aluminium-$MgZn_2$ Alloys. P. J. Saldau and M. I. Zamotorin (*Izvest. Sekt. Fiziko-Khimich. Analiza* (*Ann. Sect. Anal. Phys.-Chim.*), 1938, 11, 27–36; *C. Abs.*, 1938, 32, 9017).—[In Russian.] (*X. Met. Abs.*, 1935, 2, 671. Alloys of aluminium containing 2–30% of $MgZn_2$ were slowly cooled from 460° C. or held at that temperature for 4 hrs. and water-quenched. Time-hardness curves obtained after ageing at 15° and 100° C. showed that maximum hardness occurred in alloys containing 6–14% of $MgZn_2$. The practical limits of hardness were reached in 120 hrs. at 15° and in 20 hrs. at 100° C., although at the former temperature the true limit had not been attained even after 1000 hrs.

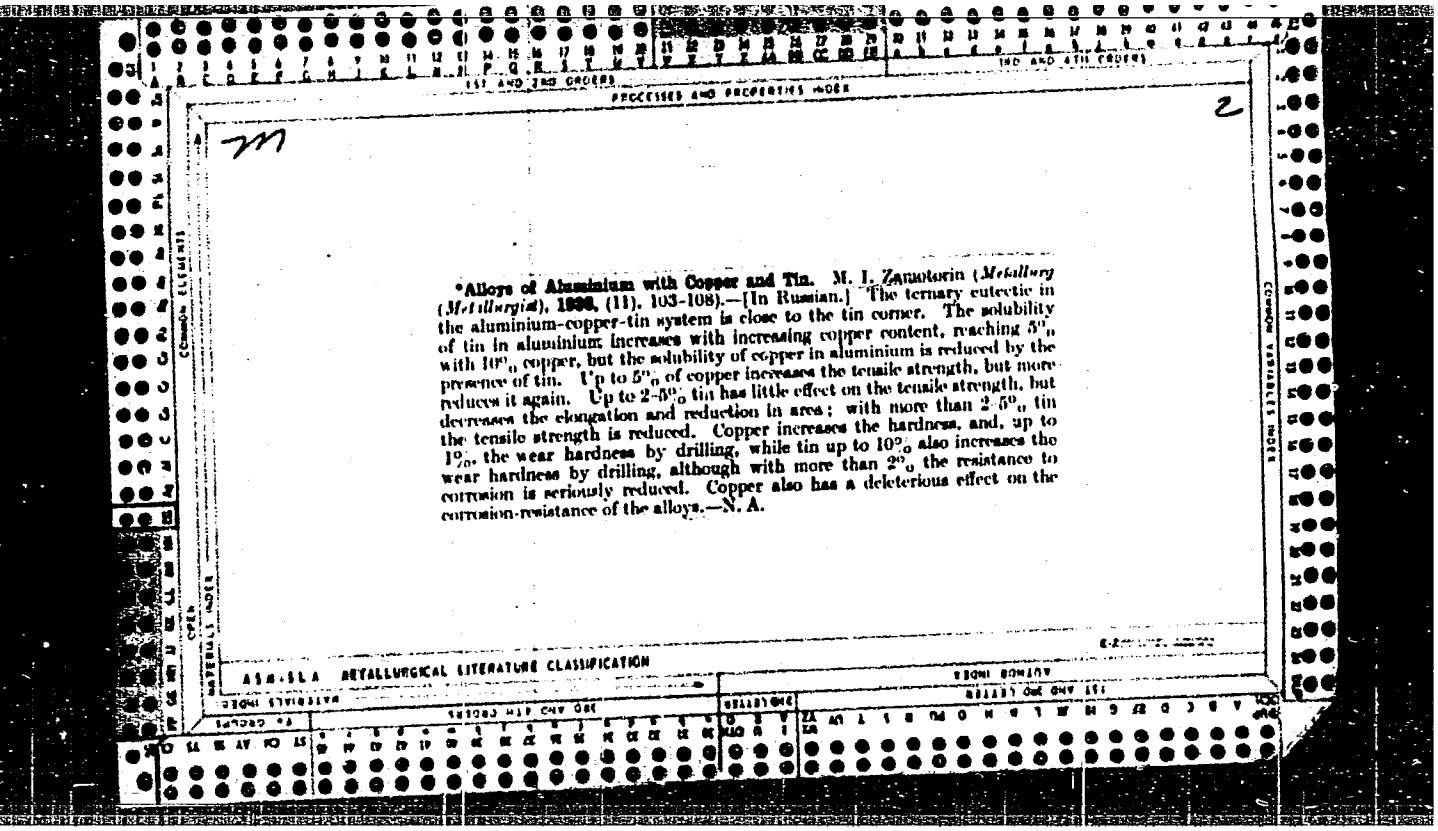
A.S.M. METALLURGICAL LITERATURE CLASSIFICATION



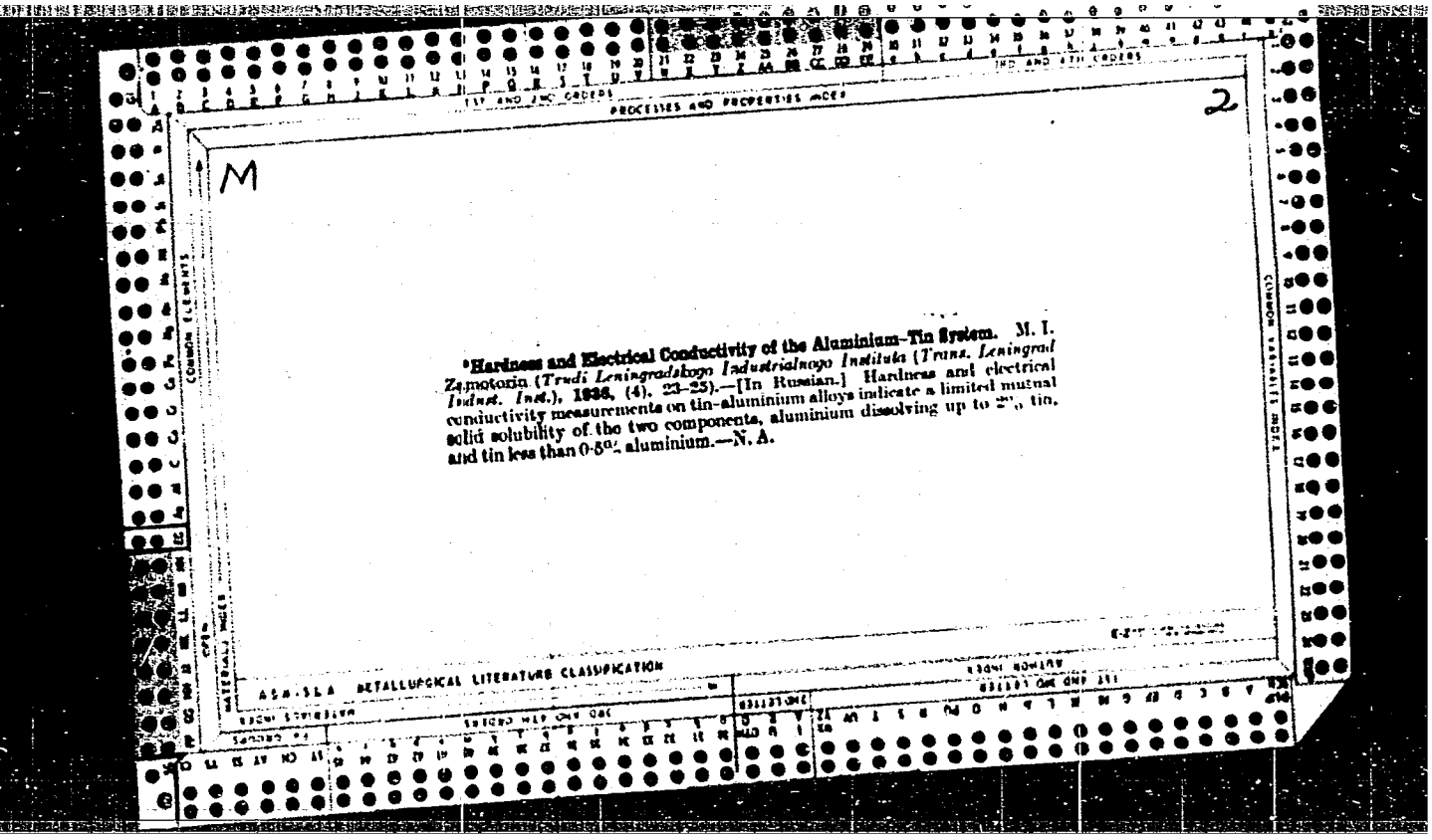
Blisters on Thin Aluminium Sheet. M. I. Zamotorin and G. N. Pukerskaya (*Metallurg* (*Metallurgist*), 1938, (12), 114–119).—[In Russian.] Refining of the metal with argon and helium proceeds very slowly and does not give results of practical value. Nitrogen dissolves in aluminium and therefore cannot be used for refining. Refining with chlorine leads to positive results in the absence of nitrogen. Treatment with zinc chloride removes the greater part of the gases with the exception of nitrogen. The best results are obtained by refining by treatment in a vacuum.—N. A.



*The Composition Diagram of the System Aluminium–Copper–Antimony (the Region Al-$CuAl_2$-AlSb). M. I. Zamotorin and L. N. Solov'eva (*Metallurg.*, 1939, (7), 11–16; *Khim. Referat. Zhur.*, 1939, (12), 21; *C. Abs.*, 1939, **24**, 7829).—[In Russian.] Cooling curves were plotted for the section $CuAl_2$–AlSb and for sections with a constant copper : antimony ratio and a constant antimony content. A pseudo-binary eutectic system is formed between $CuAl_2$ and AlSb, dividing the ternary diagram into 2 independent ternary systems. There are 3 fields of primary crystallization, AlSb, α, and $CuAl_2$. The greatest part of the diagram consists of the surface of primary separation of the AlSb crystals. The lines of the binary eutectics α + AlSb and $CuAl_2$ + AlSb intersect and form a ternary eutectic α + $CuAl_2$ + AlSb of the composition antimony 1·50, copper 34·15, aluminium 64·35%, crystallizing at 545° C. The sections with copper : antimony = 0·3 and 2·5, with constant antimony contents of 0·1, 0·3, 0·5, 2, and 3% and with a copper content of 50%, also were investigated.



•**Alloys of Aluminium with Copper and Tin.** M. I. Zamotorin (*Metallurg* (*Metallurgist*), **1936**, (11), 103-108).—[In Russian.] The ternary eutectic in the aluminium-copper-tin system is close to the tin corner. The solubility of tin in aluminium increases with increasing copper content, reaching 5% with 10% copper, but the solubility of copper in aluminium is reduced by the presence of tin. Up to 5% of copper increases the tensile strength, but more reduces it again. Up to 2–5% tin has little effect on the tensile strength, but decreases the elongation and reduction in area; with more than 2·5% tin the tensile strength is reduced. Copper increases the hardness, and, up to 1%, the wear hardness by drilling, while tin up to 10% also increases the wear hardness by drilling, although with more than 2% the resistance to corrosion is seriously reduced. Copper also has a deleterious effect on the corrosion-resistance of the alloys.—N. A.



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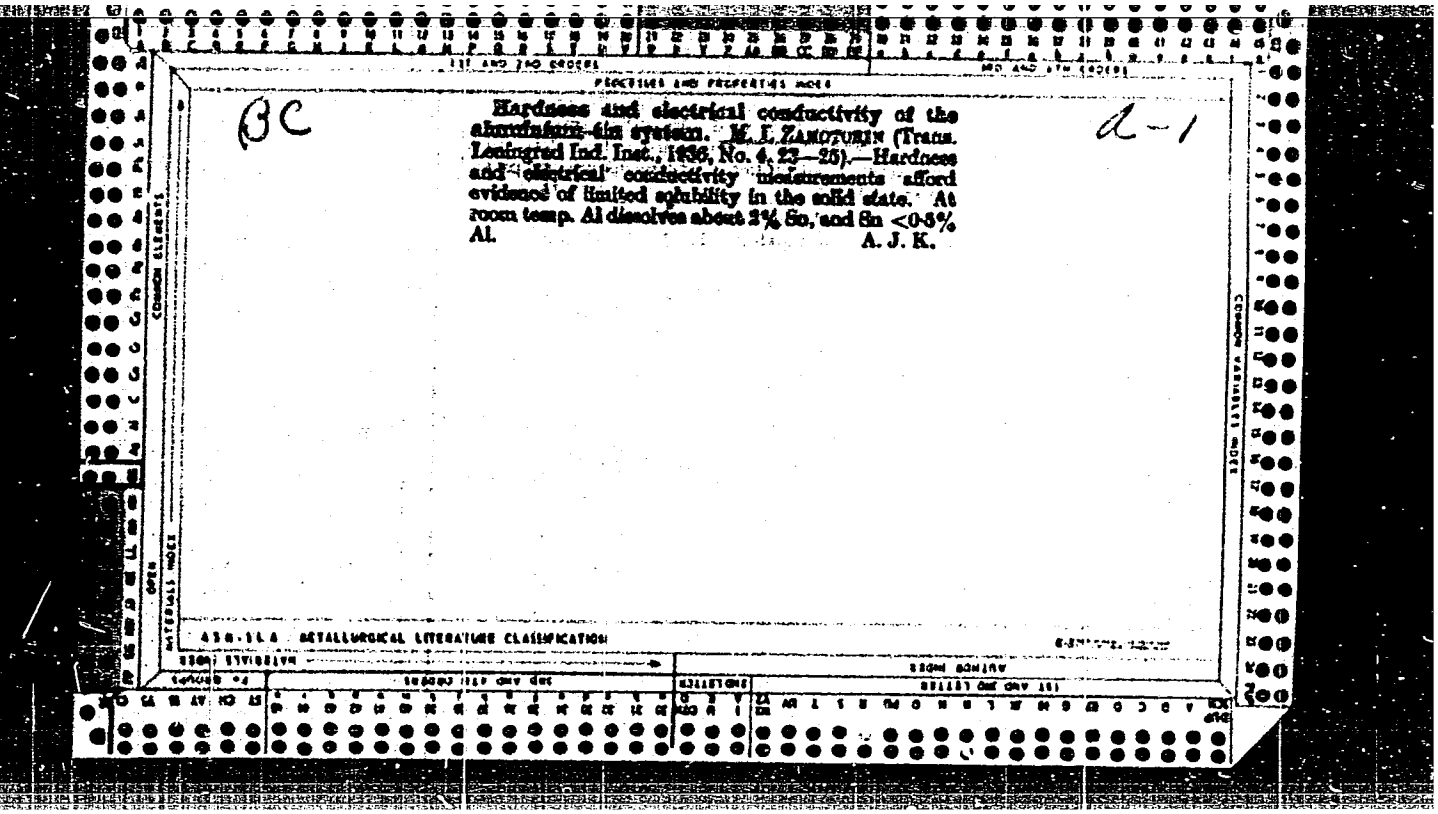
2

Hardness and Electrical Conductivity of the Aluminium–Tin System. M. I. Zamotorin (*Trudi Leningradskogo Industrialnogo Instituta* (*Trans. Leningrad Indust. Inst.*), **1936**, (4), 23–25).—[In Russian.] Hardness and electrical conductivity measurements on tin–aluminium alloys indicate a limited mutual solid solubility of the two components, aluminium dissolving up to 2% tin, and tin less than 0·5% aluminium.—N. A.

A.S.M.-S.L.A. METALLURGICAL LITERATURE CLASSIFICATION

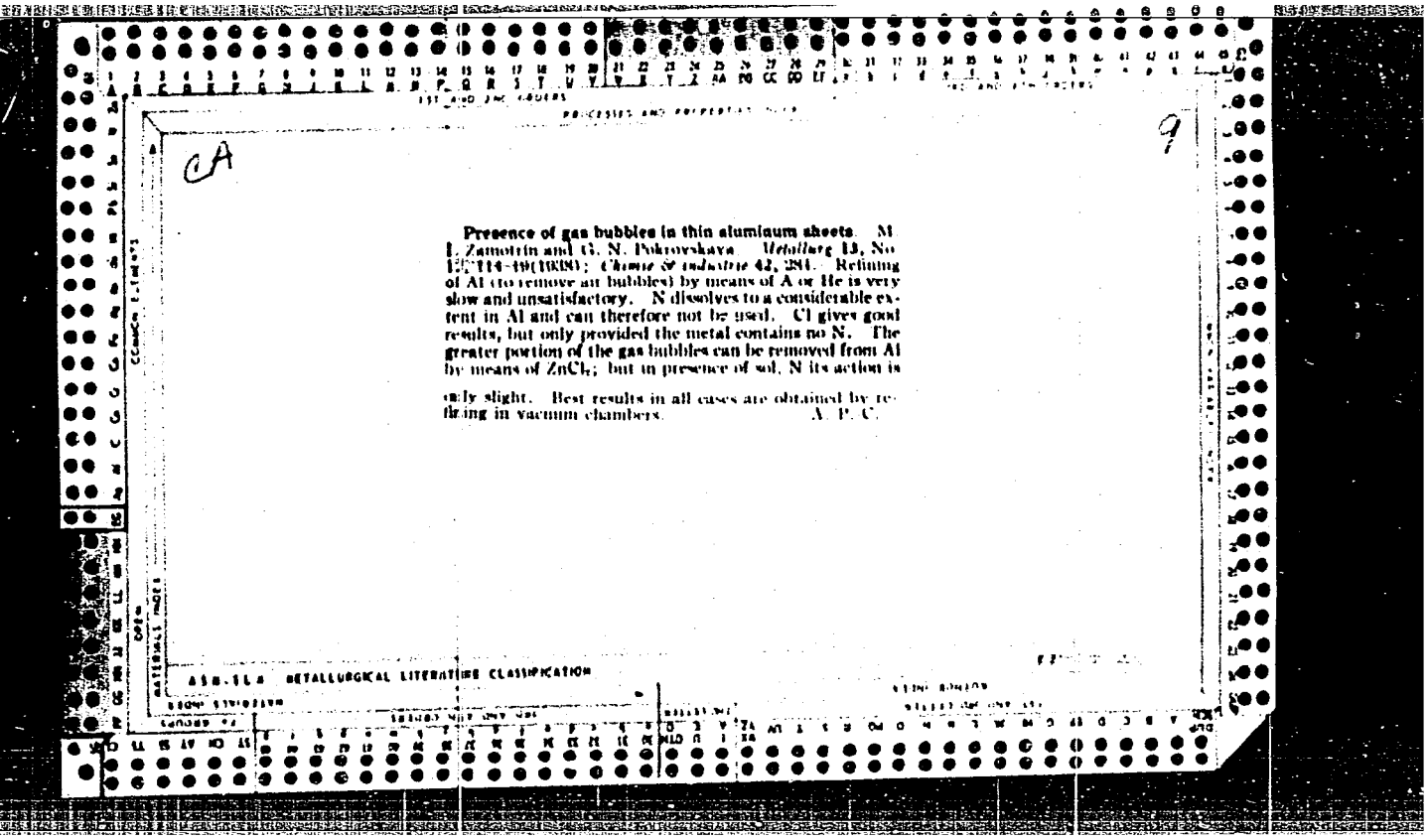


8C

Hardness and electrical conductivity of the aluminium–tin system. M. I. ZAMOTORIN (Trans. Leningrad Ind. Inst., 1936, No. 4, 23—25).—Hardness and electrical conductivity measurements afford evidence of limited solubility in the solid state. At room temp. Al dissolves about 2% Sn, and Sn <0·5% Al.

A. J. K.

a-1



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9

Presence of gas bubbles in thin aluminum sheets. M. I. Zamotrin and G. N. Pokrovskaya. *Metallurg* 13, No. 12, 114–19(1938); *Chimie & industrie* 42, 284. Refining of Al (to remove air bubbles) by means of A or He is very slow and unsatisfactory. N dissolves to a considerable extent in Al and can therefore not be used. Cl gives good results, but only provided the metal contains no N. The greater portion of the gas bubbles can be removed from Al by means of $ZnCl_2$; but in presence of sol. N its action is only slight. Best results in all cases are obtained by refining in vacuum chambers. A. P. C.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

AGEYEVA, I.N.; GREKOV, N.A.; ZAMOTORIN, M.I.

Effect of zirconium on the mechanical and electric properties of aluminum. Trudy LPI no.234:69-74 '64. (MIRA 17:11)

ZAMOTORIN, M.I.

Chemical bonds and electric properties of the primary solid solution of aluminum with magnesium and zinc. Trudy LPI no.234:5-7 '64. (MIRA 17:11)

ZAMOTIN, B.A.

Effect of immunization inactivated and attenuated by vaccines on the incidence of poliomyelitis. Trudy TomNIIVS 14:278-280 '63. (MIRA 17:7)

1. Kemerovskaya oblastnaya sanitarno-epidemiologicheskaya stantsiya.

ZAMOTIN, B.A.; VLADIMIROVA, A.I.

Water factor in the distribution of leptospirosis in the Kuznetsk Basin. Trudy Tom NIIVS 12:61-64 '60 (MIRA 16:11)

1. Kemerovskaya oblastnaya sanitarno-epidemiologicheskaya stantsiya.

*

ZAMOTIN, B.A.; VYSOKOVSKAYA, A.P.

Epidemiological effectiveness of immunization against poliomyelitis using an inactivated vaccine according to data from six cities in Kemerovo Province. Zhur. mikrobiol., epid. i immun. 33 no.2:124 F '62. (MIRA 15:3)

1. Iz Kemerovskoy oblastnoy sanitarno-epidemiologicheskoy stantsii.
(KEMEROVO PROVINCE—POLIOMYELITIS—PREVENTION)

ZAMOTIN, O.

Studying traffic regulations. Za rul. 17 no.10:16 O '59.
(MIRA 13:2)

(Traffic regulations--Study and teaching)

BELOV, N.P.; LEVINA, V.I.; ZHUKOVA, R.A.; ROYZIN, M.B.; PEREVERZEV, V.N.; MANAKOV, K.N.; BARANOVSKAYA, A.V., kand. geol.-miner., red.; ZAMOTKIN, N.Ya., red.; CHEREVATYY, P.P., tekhn. red.

[Soils of Murmansk Province and the improvement of their fertility] Pochvy Murmanskoi oblasti i povyshenie ikh plodorodiia. [By] N.P.Belov i dr. Kirovsk, Izd-vo "Kirovskii rabochii," 1963. 117 p. (MIRA 17:3)

ZAMOTORIN, M.I.

18(0) 23 PHASE I BOOK EXPLOITATION SOV/2887

Leningrad. Politekhnicheskiy institut imeni M. I. Kalinina

Metallovedeniye (Physical Metallurgy) Moscow, Mashgiz, 1959. 107 p. (Series: Its: Trudy, vyp. 202) 2,300 copies printed.

Sponsoring Agency: Ministerstvo vysshego obrazovaniya SSSR.

Resp. Ed.: V. S. Smirnov, Doctor of Technical Sciences, Professor; Ed.: G. A. Kashchenko, Professor; Tech. Ed.: L. V. Shchetinina; Managing Ed. for Literature on the Design and Operation of Machinery (Leningrad Division, Mashgiz): F. I. Fetisov, Engineer.

PURPOSE: This collection of articles is intended for engineers, technicians, and research workers in the fields of physical metallurgy and the heat treatment of metals.

COVERAGE: The papers in this collection contain the results of experimental work dealing with the study of constitution diagrams of metal systems, the nature of solid solutions, aging of complex alloys, processes occuring during the heating and cooling of alloys,

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and the thermochemical treatment of steel. References follow each article.

TABLE OF CONTENTS:

The following are the author's conclusions: The oxidation of nickel alloys containing manganese in amounts of 2.7 percent and 5.04 percent proceeds in accordance with a parabolic law during the course of a 30- to 60-minute oxidation period. Numerical data obtained for nickel containing 2.7 percent Mn showed the following increases in the oxidation rate: at 650°, 130 percent; at 750°, 140 percent; at 850°, about 200 percent; and at 950°, 300 percent. For nickel containing 5.04 percent Mn the figures were as follows: at 650°, 250 percent; at 750° and 850°, about 300 percent; and at 950°, 500 percent.

Physical Metallurgy SOV/2887

This method consists in the repeated pressing of a cone into the same spot on a specimen. This results in a series of successive impressions. The authors establish a relationship between the deformation (by the diameter of the impression) and the duration of the action of the load.

The authors give the results of an investigation, by a new method, of the nature of the imperfect elasticity of certain spring steels. It is shown that in determining the mechanical properties of spring steel by ordinary methods, considerable emphasis should be laid on the elastic aftereffect and the elastic limit, the latter being considered as depending on the duration of action of the force.

The authors give the results of a comparative study of the mechanical properties of three spring alloys, tin-phosphorus, beryllium-bronze, and German silver. The elastic limit and elastic aftereffect, little-studied characteristics, are assumed to be of basic importance. It is shown that heat treatment is decidely helpful in improving the alloys with respect to these properties.

Regimes are given for carburizing, quenching, and tempering, and results of a determination of the hardness and chemical stability of the case are given.

Results are given of a metallographic investigation of the causes of crack formation in the cut zone of case-hardened alloy steel cut with an oxyacetylene flame. Methods of controlling this problem are presented.

Physical Metallurgy SOV/2887

AVAILABLE: Library of Congress

Card 8/8

1-14-60
GO/ec

ZAMOTORIN, M.I.

Chemical bonds in primary solid solutions. Trudy LPI no.202:30-42 '59. (MIRA 12:12)
(Solutions, Solid) (Crystal lattices)

ZAMOTORIN, M.I.

Simultaneous solubility of magnesium and silver in aluminum in the solid state. Trudy LPI no.202:25-29 '59. (MIRA 12:12)
(Aluminum-magnesium-silver alloys)
(Phase rule and equilibrium)

U ZHEN KEN; ZAMOTORIN, M.I.

Phase diagram of titanium-aluminum-nickel alloys. Zhur.neorg. khim. 7 no.10:2378-2381 O '62. (MIRA 15:10)
(Titanium-nickel alloys)

137-58-4-8310

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 4, p 285 (USSR)

AUTHORS: Zamotorin, M. I., Kosovtseva, T.S.

TITLE: Hydrogen in Low Carbon and Alloy Steels (Vodorod v maloug-lerodistoy i legirovannoy stali)

PERIODICAL: V sb.: Metallurgiya. Moscow-Leningrad, AN SSSR, 1957, pp 77-94

ABSTRACT: The mechanisms of saturation and liberation of hydrogen and the forms taken by it in low-carbon (0.08% C), (12 KhNZA) chromium nickel steel, and low carbon steel containing Ti (0.03% C, 0.5% Ti) are examined. Saturation with H was performed electrolytically in a 5% H_2SO_4 solution. The H content of the specimens was determined by vacuum heating. It was established that saturation of steel with atomic H occurs in three stages. In the first period there occurs the diffusion of the H atoms, the filling of microscopic spaces and the formation of a solid solution of H in α Fe, which increases the lattice parameter, distorts the lattice, raises electrical resistivity (ρ), and improves hardness (R_B) and strength. The second period consists in the development of a powerful molecular H_2 pressure. The metal is com-

Card 1/2

Hydrogen in Low Carbon and Alloy Steels

pressed from all sides. This diminishes contact along slide planes and grain boundaries and diminishes the atomic distances, ρ, σ_b, and R_B, and markedly reduces δ %. During the third period, the H_2 pressure exceeds the σ_p of the given metal, and cracks form near the surface of the specimen and in low-strength areas, while atomic distances, ρ, R_B and contact along slide surfaces increase. In pure Fe and low-alloy steels the effect of atomic H is balanced out by the effects of molecular H_2. The ultimate solid solution contains $\leq$10% of the total amount of H, a considerable portion of the H being in the molecular state in microscopic pores. Solid solutions in αFe formed on saturation of steel by atomic H are unstable. When steel saturated with H is allowed to stand at room temperature, a great part of the H is liberated in the molecular state along joint planes and grain boundaries, only a negligible portion of the H being liberated into the atmosphere by rediffusion.

A. M.

1. Steel--Properties--Effects of hydrogen 2. Hydrogen embrittlement--Analysis

Card 2/2

L 23833-65 EWT(m)/EWP(w)/EPF(n)-2/EWA(d)/EPR/T/EWP(t)/EWP(b) Pe-5/Pu-4 JD/HM/JG

ACCESSION NR: AT4045951 S/2563/64/000/234/0069/0074

AUTHOR: Ageyeva, I. N.; Grekov, N. A.; Zamotorin, M. I. 37

TITLE: The effect of zirconium on the mechanical and electrical properties of aluminum 27

SOURCE: Leningrad. Politekhnicheskiy institut. Trudy*, no. 234, 1964. Metallovedeniye (Metallography), 69-74

TOPIC TAGS: mechanica property, electrical property, zirconium, aluminum

ABSTRACT: With a view to improving the strength of Al to make it suitable for use in conductors, the authors investigated the mechanical and electrical properties of annealed as well as hardened Al-Zr specimens. All specimens were homogenized at 450C, cold-rolled and forged into 6 mm diam. rods. In quantities of 0.5 to 0.7% Zr improved the strength of annealed and quenched specimens. Their yield point was 7 to 10 kgG/mm^2, the rupture strength 9 to 11 kgG/mm^2 and elongation per unit length 15 to 17%. Electrical resistivity was 3.2 to 3.3. 10^{-6} ohm·cm, electrical conductivity 30 to 31.8 ohm^{-1} cm^{-1} (51 to 53% of the

Card 1/2

L 23833-65
ACCESSION NR: AT4045958

electrical conductivity of Cu); thermal coefficient of electrical resistance within [illegible] 3 figures and 4 tables

ASSOCIATION: Leningradskiy politekhnicheskiy institut (Leningrad Polytechnic Institute)

SUBMITTED: 00 ENCL: 00 SUB CODE: MM

NR REF SOV: 003 OTHER: 004

Card 2/2

L 43102-66 EWT(m)/EWP(w)/T/EWP(t)/ETI IJP(c) JH/JD/WW/JG

ACC NR: AP6014118 (N) SOURCE CODE: UR/0370/65/000/006/0130/0131

40
39
B

AUTHORS: Zamotorin, M. I. (Leningrad); Zamotorina, T. M. (Leningrad)

ORG: none

TITLE: Solid state solubility of zirconium in aluminum

SOURCE: AN SSSR. Izvestiya. Metally, no. 6, 1965, 130-131

TOPIC TAGS: alloy phase diagram, zirconium containing alloy, aluminum containing alloy

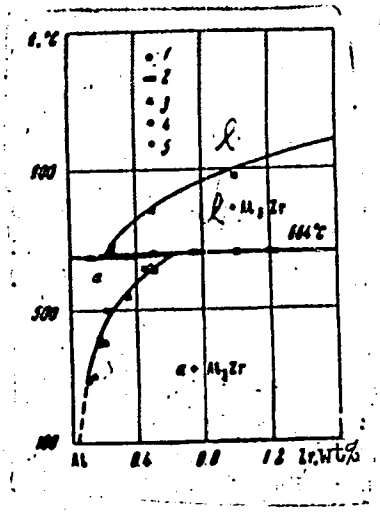
ABSTRACT: The solid state solubility of zirconium in aluminum was investigated. The investigation was prompted by existing literature discrepancies with respect to this problem. The specimens were prepared after the method of A. A. Fogel' (Beztigel'naya plavka laboratornykh obraztsov v. vakuume ili v atmosfere inertnogo gaza. Izv. AN SSSR, OTN, 1959, No. 2, 24). The solubility was determined by means of thermal, dilatometric, x-ray, microhardness, and electrical resistance analysis. The experimental results are presented graphically (see Fig. 1). It was found that the limiting solubilities of Zr in Al agreed closely with those determined by V. M. Glazov, T. P. Lazarev, and T. A. Korol'kov (Rastvorimost' nekotorykh perekhodnykh metallov v alyuminii. Metallovedeniye i termicheskaya obrabotka metallov, 1959, No. 10, 48).

Card 1/2 UDC: 669.017.12

L 43102-66

ACC NR: AP6014118

Fig. 1. Solid state solubility of zirconium in aluminum. 1 - thermal analysis; 2 - dilatometric analysis; 3 - x-ray analysis; 4 - electrical resistivity measurements; 5 - hardness measurements.



Orig. art. has: 1 graph.

SUB CODE: 11/ SUBM DATE: 11Jan65/ ORIG REF: 003/ OTH REF: 003

Card 2/2 MLP

ZAMOTORIN, N.V

YEREMIN, A.V., inzh.; ZAMOTORIN, N.V., inzh.

Results of testing grain combines in 1957. Mekh. i elk. sots. sel'khoz. 15 no.2:45-51 '58. (MIRA 11:5)

1. Ministerstvo sel'skogo khozyaystva SSSR.
(Combines (Agricultural machinery))

ZAMOTORIN, N.I. (Leningrad); ZAMOTORINA, T.M. (Leningrad)

Solubility of zirconium in aluminum in the solid state.
Izv. AN SSSR. Met. no.6:130-131 N-D '65.
(MIRA 19:1)

1. Submitted January 11, 1965.

L 43102-66 EWT(m)/EWP(w)/T/EWP(t)/ETI IJP(c) JH/JD/WW/JG

ACC NR: AP6014118 (N) SOURCE CODE: UR/0370/65/000/006/0130/0131

40
39
B

AUTHORS: Zamotorin, M. I. (Leningrad); Zamotorina, T. M. (Leningrad)

ORG: none

TITLE: Solid state solubility of zirconium in aluminum

SOURCE: AN SSSR. Izvestiya. Metally, no. 6, 1965, 130-131

TOPIC TAGS: alloy phase diagram, zirconium containing alloy, aluminum containing alloy

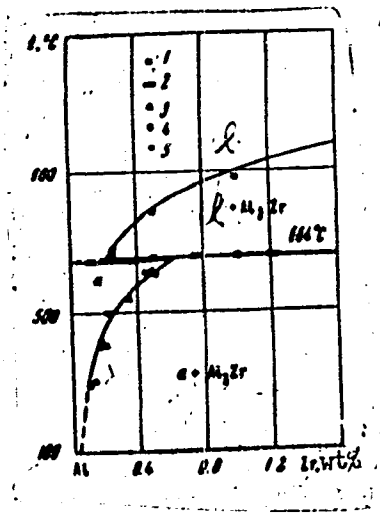
ABSTRACT: The solid state solubility of zirconium in aluminum was investigated. The investigation was prompted by existing literature discrepancies with respect to this problem. The specimens were prepared after the method of A. A. Fogel' (Beztigel'naya plavka laboratornykh obraztsov v. vakuume ili v atmosfere inertnogo gaza. Izv. AN SSSR, OTN, 1959, No. 2, 24). The solubility was determined by means of thermal, dilatometric, x-ray, microhardness, and electrical resistance analysis. The experimental results are presented graphically (see Fig. 1). It was found that the limiting solubilities of Zr in Al agreed closely with those determined by V. M. Glazov, T. P. Lazarev, and T. A. Korol'kov (Rastvorimost' nekotorykh perekhodnykh metallov v alyuminii. Metallovedeniye i termicheskaya obrabotka metallov, 1959, No. 10, 48).

Card 1/2 UDC: 669.017.12

L 43102-66

ACC NR: AP6014118

Fig. 1. Solid state solubility of zirconium in aluminum. 1 - thermal analysis; 2 - dilatometric analysis; 3 - x-ray analysis; 4 - electrical resistivity measurements; 5 - hardness measurements.



Orig. art. has: 1 graph.

SUB CODE: 11/ SUBM DATE: 11Jan65/ ORIG REF: 003/ OTH REF: 003

Card 2/2 MLP

ACCESSION NR: [illegible]

AUTHOR: Andreyevskaya, G. D. (Moscow); Gorbatkina, Yu. A. (Moscow); Zamotova, A. V. (Moscow); Kiseleva, R. L. (Moscow); Odnoletkova, T. V. (Moscow); Khvilivitskiy, R. Ya. (Moscow)

TITLE: Effect of modification of the glass fiber surface on the adhesion and mechanical strength of glass [illegible] polyester plastic

ABSTRACT: A study has been made of the adhesion strength of epoxy-polyester binders to glass fibers and its effect on the mechanical properties of glass-reinforced plastics. The experiments were conducted with polyester resin modified with ED-6 epoxy resin containing carboxyl compounds. Benzoyl peroxide or methyltetrahydrophthalic anhydride curing agents were used. Alkali-free glass fibers (7--12 μ in diameter) were used as the filler. The fibers were either nonmodified or modified with a paraffin lu- [illegible] hydrophobic agent finishes such as Volan (chromium methae-

L 41828-65

ACCESSION NR: AP5011993

rylate chloride—chromium oxychloride complex), vinyltriethoxysilane, or amino derivatives of organosilicon monomers (γ-aminopropyltriethoxysilane, AGM-3). These difunctional finishes react with both the glass fiber surface and the binder. In order to stabilize the water-repellant finish on the glass surface and form a strong adhesive bond, the fibers were modified immediately after drawing by immersion for 3—5 min in 0.3% aqueous finish solutions, drying at room temperature, and heat treatment for 20—30 min at 120° C.

Adhesive strength

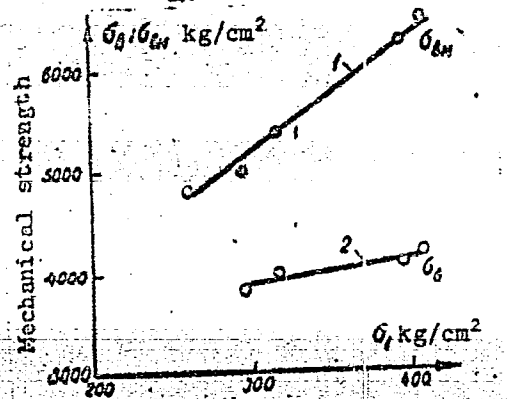


Fig. 1. Effect of glass fiber surface modification on the mechanical properties of glass-reinforced plastics

1 - Bending strength; 2 - tensile strength.

Card 2/5

L 42828-65

ACCESSION NR: AP5011993

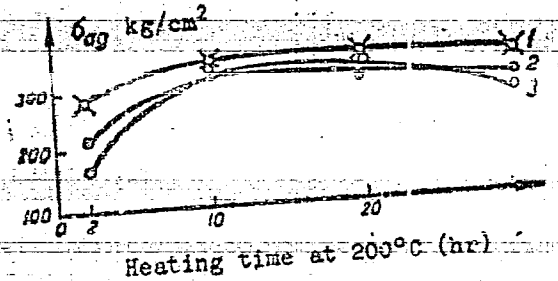
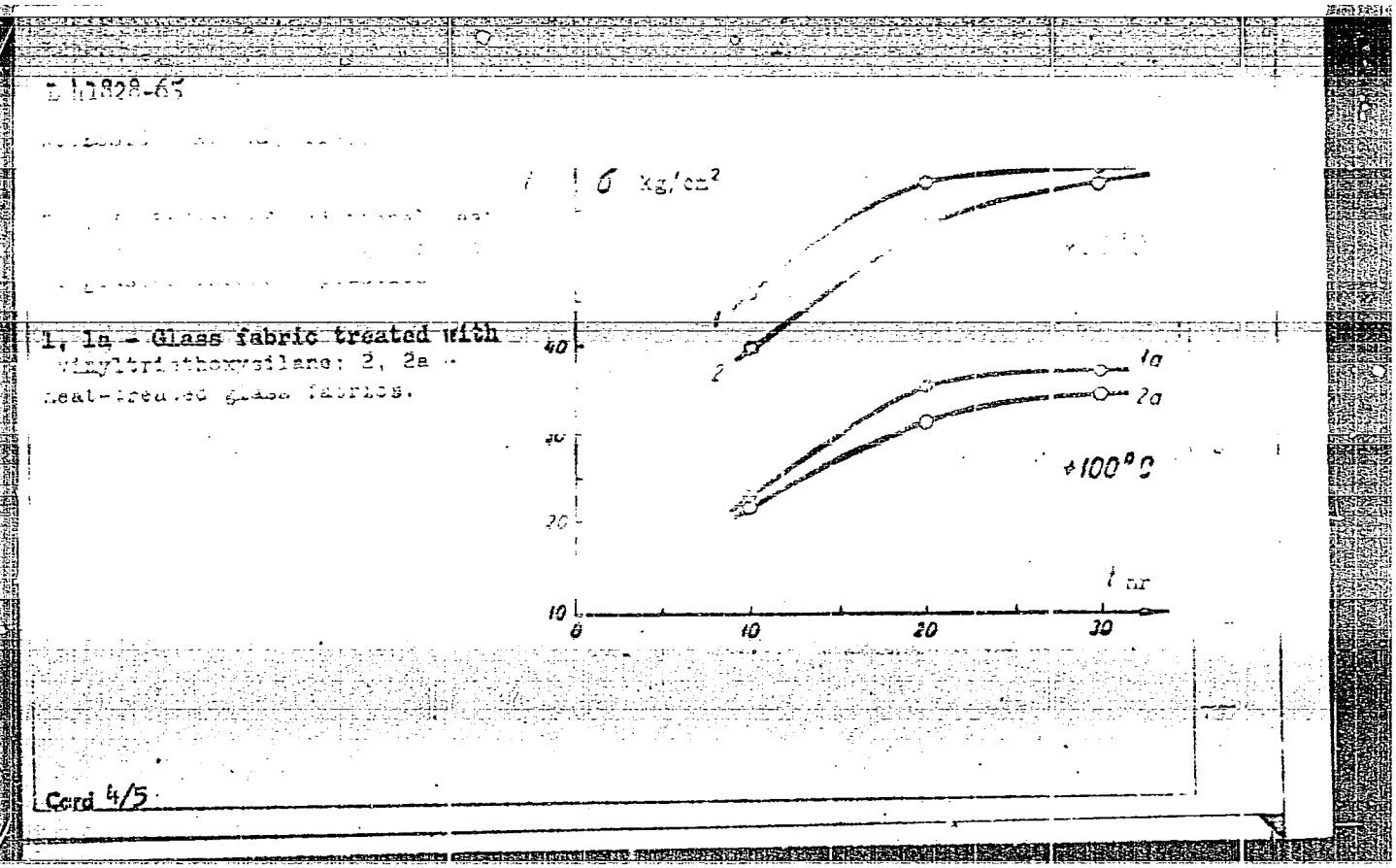


Fig. 2. Effect of additional heat treatment on the adhesion strength of epoxy-polyester polymer to glass fibers

1 - Fibers modified with vinyltriethoxysilane; 2 - nonmodified fibers; 3 - fibers treated with a paraffin lubricant.

Measurements of adhesive bond strength showed that the binder adheres more strongly to modified fiber surfaces than to nonmodified or lubricated surfaces. The best results were obtained with vinyltriethoxysilane and amino derivatives of ethoxysilanes, which form a strong bond with the glass surface and participate in the formation of network structures during polymerization of the binder.

Card 3/5



1, 1a – Glass fabric treated with vinyltriethoxysilane; 2, 2a – heat-treated glass fabrics.

Card 4/5

L 41828-65

ACCESSION NR: AP5011993

The relationship between the adhesive strength and the mechanical properties of gales-fabric reinforced plastics was studied by bending and tensile tests. The results given in Figs. 1-3 indicate that finishing and additional heat treatment, which increase the adhesion between binder and glass fiber, also improve the mechanical properties of the epoxy-polyester glass reinforced plastics.

ASSOCIATION: none

SUBMITTED: 17Aug64 ENCL: 00 SUB CODE: MT, GC

NO REF SOV: 008 OTHER: 000 ATD PRESS: 3206-F

Card 5/5

L 22000-66 EWT(m)/EWP(v)/EWP(j)/T/ETC(m)-6 IJP(c) M./RM

ACCESSION NR: AP5024504 UR/0191/65/000/010/0031/0034 28
678.674.06-419:677.521.01.539.219.2 13

AUTHOR: Sukhareva, L. A.; Smirnova, Yu. P.; Zubov, P. I.; Zamotova, A. V.; Khvilivitskiy, R. Ya.

TITLE: Internal strain in reinforced systems based on polyester acrylate binders

SOURCE: Plasticheskiye massy, no. 10, 1965, 31-34

TOPIC TAGS: fiberglass, glass cloth, epoxy plastic, polyester plastic, adhesion, internal stress, bending strength, rupture strength

ABSTRACT: The effect of curing conditions, binder composition and surface treatment of the reinforcing glass on the internal strain, mechanical, and adhesive properties of fiberglass was studied. Two curing rates were used--(1) gradual heating for 19 hours to 200 C and then holding at 200 C for 10 hours, and (2) heating to 200 C in 2 hours and holding for 20 hours. Glass cord treated with paraffin emulsion or with vinyltriethyoxysilane and glass cord heat treated at 400-450C were used for reinforcing. A two-component system (epoxy resin and polyester acrylate MD) or a three-component system (epoxy, MD and an unsaturated carboxyl-containing compound) were used as binders. Internal strain was

Card 1/2

L 22000-66

ACCESSION NR: AP5024504 0

greater across the warp than along the warp. Greater internal strains were produced by the slower curing method. The mechanical characteristics of fiberglass cured by method (2) were generally higher. Physical-mechanical properties and internal strain were lower in fiberglass made of the three-component binder. Paraffin emulsion had little effect on internal strain, while the silane coating increased internal strain in the fiberglass made of the three-component binder. The strength properties of the fiberglass depend on the ratio of the internal strain values to the adhesion of the binder to the glass fiber surface. Fiberglass made of resin based on the carboxyl-containing compound, which has greatest internal strain and least adhesion, is weakest. Greatest strength was obtained with the three-component binder applied to glass cloth treated with vinyltriethyoxysilane, where adhesive strength exceeds 200 kg/sq cm and the glass is torn out when the sample is broken. Orig. art. has: 8 figures and 3 tables

ASSOCIATION: None

SUBMITTED: 00 ENCL: 00 SUB CODE: II

NR REF SOV: 003 OTHER: 000

Card 2/2 BK

ACCESSION NR: AR4042158 S/0196/64/000/005/B008/B009

SOURCE: Ref. zh. Elektrotekhnika i energetika, Abs. 5B42

AUTHOR: Nesterov, V. M.; Zamotrinskaya, Ye. A.

TITLE: Measurement of electrical parameters of insulating materials at the moment of Gamma irradiation

CITED SOURCE: Mezhvuz. sb. tr. Zap.-Sib. sovet po koordinatsii i planir. nauchno-issled. rabot po tekhn. i yestestv. naukam, vy*p. 2, 1963, 127-129

TOPIC TAGS: electric parameter, insulating material, Gamma irradiation, resonator, sensor, waveguide

TRANSLATION: Irradiation leads to errors of measurement, since ionized air shunts the specimen. In order to avoid this, a special vacuum chamber was designed. Measurement of specific conductivity in a vacuum with help of a d-c amplifier of the "Cactus" type under irradiation is safe for the observer. Measurement of ε and $\tan\delta$ at 10 cps was carried out by the resonator method. For that, a toroidal resonator was used into whose slot the sensor under investigation was introduced.

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ACCESSION NR: AR4042158

By measurement of the resonator, the change C of the slot was determined and, consequently, ϵ of the sensor. By change of the Q-factor tan δ was determined. Measurement of ϵ and tan δ at f $3 \cdot 10^9$ and 10^{10} cps was carried out by the waveguide method. In order to avoid the effect of radiation on the equipment and observer, the measuring line was connected with the section of the waveguide containing the sensor, through the waveguide or cable connection, passing through the shield. These connections have a configuration such as to exclude passage through them of γ-rays. When in the connection there is significant damping, the accuracy of measurements of ϵ and tan δ sharply drops. One illustration. Bibliography: 9 references.

SUB CODE: EC, NP ENCL: 00

Card 2/2

ZAMOTRINSKAYA, Ye.A.

Effect of gamma rays on electron paramagnetic resonance in $CuSO_4 \cdot 5H_2O$.
Izv.vys.ucheb.zav.;fiz.no.2:178-179 '63.
(MIRA 16:5)

1. Sibirskiy fiziko-tekhnicheskiy institut pri Tomskom gosudarstvennom universitete imeni Kuybysheva.
(Paramagnetic resonance and relaxation)
(Copper sulfate)

VOROZHTSOV, B.I.; NESTEROV, V.M.; ZAMOTRINSKAYA, Ye.A.; FILATOV, I.S.

Dielectric properties of insulating materials following gamma irradiation. Part 1. Methods for measuring the dielectric characteristics during irradiation. Izv.vys.uch.zav.; fiz. no.4:163-170 '62. (MIRA 15:9)

1. Sibirskiy fiziko-tekhnicheskiy institut pri Tomskom gosudarstvennom universitete imeni V.V. Kuybysheva.
(Dielectrics, Effect of radiation on) (Gamma rays)

BAKHTYAROV, S.S.; ROGOVA, V.I.; ZAMOVA, M.V.

[Kazan; a photo album] Kazan'; foto-al'bom. Kazan', Tatarskoe knizhnoe izd-vo, 1960. 1 v. [Russian and Tatar text] (MIRA 14:12)
(Kazan—Views)

MILOVSKAYA, Ye.B.; ZAMOYSKAYA, L.V.

Radical polymerization of polar monomers under the effect of the triethylaluminum - dicyclohexyl peroxydicarbonate system. Vysokom. soed. 7 no.4:670-673 Ap '65.

(MIRA 18:6)

1. Institut vysokomolekulyarnykh soyedineniy AN SSSR.